

FLIGHT

The
AIRCRAFT ENGINEER
AND AIRSHIPS

First Aeronautical Weekly in the World. Founded January, 1909

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice and Progress of Aerial Locomotion and Transport

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

No. 1159. (Vol. XXIII. No. 11.)

MARCH 13, 1931

Weekly, Price 6d.
Post free, 7½d. Abroad, 8d.

Editorial Offices: 36, GREAT QUEEN STREET, KINGSWAY, W.C.2.

Telephone: (2 lines), Holborn 3211 and 1884.

Telegrams: Truditur, Westcent, London.

Annual Subscription Rates, Post Free.

United Kingdom .. 33s. 0d. United States .. \$8-75.
Other Countries .. 35s. 0d.*

* Foreign subscriptions must be remitted in British currency (See last Editorial Page.)

CONTENTS

	PAGE
Editorial Comment:	
The Air Estimates	217
Duration and Distance	219
A New Autogiro	220
British Empire Trade Exhibition, Buenos Aires, 1931	221
Aeronautics in the Argentine: By C. Rivers Anderson	225
Gliding	226
Private Flying and Club News	227
Airport News	228
Air Transport	229
International Aeronautical Conference	230
Air Estimates	231
Airships from the Four Winds	235
R.A.F. Cape Flight	237
Floatplane Survey in the Sudan	237
Correspondence	238
Meteorology and Air Navigation: By Lt.-Commandr. J. W. Josselyn	239
Public Economy and the Air Council	240
Report of the Department of Scientific and Industrial Research	240
Models	240
Royal Air Force	241
Air Post Stamps	242

DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

- 1931
- Mar. 14. Opening of British Empire Trade Exhibition, Buenos Aires.
- Mar. 14. Association Football: R.A.F. v. Army.
- Mar. 14. No. 10 Sqdn. R.F.C. and R.A.F. Reunion Dinner at Ye Old Pindar of Wakefield, Gray's Inn Road.
- Mar. 19. "Research in the Berlin Technische Hochschule." Lecture, by Dr. W. Hoff, before R.Ae.S.
- Mar. 19. "Care and Maintenance of Engines." Lecture by K. Smith, before R.Ae.S. (Glos. and Chelt.).
- Mar. 25. R.Ae.C. Annual General Meeting.
- Mar. 27. "Flying of High Speed Seaplanes." Lecture, by Sqdn.-Ldr. A. H. Orlebar, before R.Ae.S., Hull.
- Mar. 28. Association Football: R.A.F. v. R.N. & R.M., Mill-wall.
- Mar. 28. Rugby Football: R.A.F. v. Army, at Twickenham, 3 p.m.
- Mar. 31. "Injection, Ignition and Combustion in High-Speed, Heavy-Oil Engines." Lecture, by Dr. S. J. Davies and E. Giffen, before R.Ae.S.
- April 7. Air League Children's Fete, Hanworth Air Park.
- April 11-19. National Aircraft Show, Detroit, U.S.A.
- April 16. "Aircraft Noise." Lecture, by Dr. A. H. Davis, before R.Ae.S.
- April 22. Air League Annual Dinner, at Dorchester House, Park Lane.
- April 27. Closing date of British Empire Trade Exhibition, Buenos Aires.
- April 30. "Aerodynamics of Sails." Lecture, by Dr. M. Curry, before R.Ae.S.
- May 14. "Metal-Clad Airship." Lecture, by C. Fritsche, before R.Ae.S.
- May 15-31. Stockholm Aero Show.
- May 30. London-Newcastle Air Race, for "Newcastle Evening World" Trophy.
- June 6. Newcastle Ae.C. Meeting, at Cramlington.
- June 20. Flying Display and Air Pageant, Bristol Airport.

EDITORIAL COMMENT



AN increase of a quarter of a million in the net total of the Air Estimates complies well with the present demand for economy. A programme of steady though slow increase is in operation, and increased numbers must mean increased expenditure. However great may be the demand for economy, this growth in the strength of the Royal Air Force cannot be abandoned. We are still far below the safety limit, and even when the present programme has been completed, we shall still be short of a position in which we can contemplate an air attack with confidence. So the expansion must needs go on, though its pace is being kept very slow. Extravagance, or judicious economy, or even parsimony, still implies an increase in the Estimates. It is only by considering the amount of the increase that we can form an opinion as to which of the three above-mentioned principles has been at work in framing the Estimates.

The present Estimates provide for the formation of three new regular squadrons for the Air Defence of Great Britain, and one new flight for the Fleet Air Arm. We may for the moment disregard the last-named unit, as its cost does not come into the net Estimates. It is paid for by the Admiralty by an appropriation in aid. This is quite right, for the Fleet Air Arm adds to the strength of the Royal Navy, and not to the strength of the Air Defence of Great Britain. We wish that the cost of the Army Co-operation Squadrons and of the School of Army Co-operation were likewise paid for by the War Office, as they ought to be, as they are concerned with Land Defence and not with Air Defence.

We may pause here to consider a somewhat puzzling remark of the Secretary of State for Air in the Memorandum which accompanies the Estimates. He says that, if one disregards two appropriations in aid, namely, the contributions from Dominion and Colonial Governments towards the opening of the Africa air route, and also Lady Houston's contribution towards the cost of defending the Schneider Trophy (incidentally the name of Lady Houston is not mentioned), the gross Estimates

give a truer index of air expenditure from year to year. Air expenditure—yes; air strength—no! The Air Minister evidently likes to claim credit for increases in the numbers of all men who wear the blue uniform of the Royal Air Force and of all aircraft painted with the red, white, and blue rings, and if the net Estimates only are considered, then the Fleet Air Arm must be left out of account. But when we consider our preparedness to meet an air attack, which is the chief and governing function of the Air Force, it is best to leave out of account the men and machines which work only for the Navy (and for that matter those which work for the Army), and which, therefore, can play no part in meeting an air invasion of Great Britain. The units in India are also rightly provided for by an appropriation in aid from the Indian Government. They, too, add nothing to the strength of the Air Defence of Great Britain, and the same can be said of all the overseas units of the Royal Air Force.

It is the custom to state that we hold the fifth place among the air Powers of the world. This figure is only arrived at by including in our air strength the units which do only naval or military work, and which are not available for an air campaign. Consequently a false impression is created. So far as the vital matter of defending our own country is concerned, we must stand far lower than fifth. The units overseas are on a somewhat different footing from the Fleet Air Arm. It is not inconceivable that there may be a war on the North-West Frontier of India, when our neighbours in Europe would be so deeply in sympathy with us that we might with safety leave the shores of Great Britain undefended. Then our air strength might be computed by adding the strength of the Air Defence of Great Britain to that of the units overseas. And, of course, in certain sorts of emergencies, the Navy might lend its air units to the fighting front, just as it sometimes lends a Naval Division to the Army. But, generally speaking, we are chiefly interested in the strength of the command known as Air Defence of Great Britain, and secondarily in the number of bomber squadrons in the overseas commands. The Fleet Air Arm and the Army Co-operation squadrons add nothing to air strength, and therefore we prefer to regard the net Estimates rather than the gross Estimates as giving the best index of our increase in air strength.

We come back, then, to the announcement that Air Defence of Great Britain is to be increased by three regular squadrons, and that the increase in the net Estimates is only a quarter of a million. We should, of course, have liked to see a much greater increase in the number of Home Defence squadrons, but for a time of great financial stringency, this state of affairs cannot be regarded as too unsatisfactory. Mr. Montague stated the other day in the House of Commons that the annual cost of a single-engine day-bomber squadron was roughly about £100,000 a year; so that the provision of three bomber or fighter squadrons with a net increase in the Estimates of no more than £250,000, is a good piece of work. It indicates very careful economy in other directions, and this, so long as it does not endanger

efficiency or inflict unjust hardship on individuals, is a thing to approve most heartily.

Of the comments in the Memorandum on the various votes, the most interesting concern Vote I (Pay, etc.). It is explained that the increase of £176,000 would have been greater but for economies effected in other directions. The economies mentioned are novelties, and they appear to be on sound lines. The question of Stores officers has been under review. The number of these officers who can look to the Service for a life's career has been cut down to a minimum, with the result that the prospects of the survivors have been improved. The remaining posts, which are in junior ranks, will be filled either by retired officers employed as civilians, or by promoting to commissioned rank a substantial number of warrant officers drawn from all trades. Hitherto, airmen have only had two avenues to commissions, both as piloting officers; first, among the aircraft apprentices at Halton a certain number were able to win cadetships at Cranwell, and, secondly, a certain number of sergeant pilots were given commissions. The prospect of a commission in the Stores branch will add to the attractions of enlistment in the Royal Air Force.

Another economy is to be effected by appointing a number of warrant officers and non-commissioned officers as armament instructors in squadrons, and thus relieving a corresponding number of officers. We can only express surprise that this was never tried before. Generally speaking, the Royal Air Force has been too prone to lay all its burdens on the shoulders of officers and not to give sufficient responsibility to the senior non-commissioned and warrant ranks. We have several times urged that there ought to be more airmen pilots, and the only reason which we have ever heard against the adoption of this suggestion is that there might not be enough officers left for ground duties. This seems to show wastefulness in the use of officers, and we are glad to note in these Estimates a tendency to give more responsibilities to selected airmen.

There is a brief, but very welcome, sentence in the comment on Vote 3 (Technical and Warlike equipment). No less than 12 squadrons are to be re-equipped with up-to-date types of aircraft, and the last of the war-time types are to disappear from the Service. The 12 squadrons will certainly include five Army Co-operation squadrons which still have the "Bristol Fighter," namely, No. 5 at Quetta, No. 6 at Ismailia, No. 20 at Peshawar, No. 28 at Ambala, and No. 31 at Quetta. Then there are nine fighter squadrons in the Fighting Area which have obsolescent types: Nos. 1, 19, 25, 29, 41, 43, 56, 111, have the "Siskin," and No. 23 has the "Gamecock." Some of these will obviously have to wait another year, though their machines are known to be useless against bombers of the class of the "Fox" or the "Hart." Among bomber squadrons we hope that some more will receive the "Hart," presumably in place of the "Horsley"; but if that is so, then still more of the fighters will have to bear with their "Siskins" for another year. But we must be thankful for small mercies; and to have 12 squadrons modernised is a real cause for thankfulness.



DURATION AND DISTANCE

FURTHER details are to hand regarding the two new aeronautical records established recently by the French airmen, Lucien Bossoutrot and Maurice Rossi. The one a duration performance for continuous flight without refuelling, the other the Long-Distance Continuous Flight Record over a closed circuit.

Flying around a course centering at Oran, French North Africa, and using a Bleriot 110, a specially-constructed monoplane powered by a 600-h.p. Hispano-Suiza motor, Bossoutrot and Rossi held the air continuously, without refuelling, for 75 hr. 22 min., during which time they covered 8,805 km. (5,505 miles) in a closed circuit.

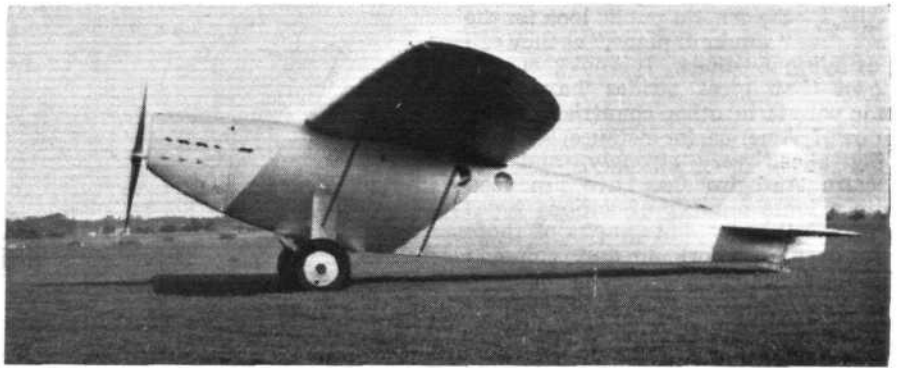
The best previous performance for a continuous flight had been that of the Italian airmen Maddalena and Cecconi, who on June 2, 3 and 4, 1930, flew for 67 hr. 13 min., and traversed 8,188.8 km. (5,118 miles) over a closed circuit.

The Bleriot 'plane used by the French airmen carried 6,250 litres (1,400 gallons approximately) of petrol, and 230 litres (51 gallons approximately) of oil. Taking off easily, notwithstanding this heavy load, from the airport of Senia, near Oran, at 7.19 a.m., Thursday morning, February 16, Bossoutrot and Rossi encountered fine weather for the first 60 hr. of their flight. A speed of 125 km. (80 miles) per hour was maintained, and the pilots looked forward to remaining at least 85 hr. in the air.

On the night of the third day, however, bad weather and violent squalls set in, and the airmen were obliged to reduce their speed to about 80 km. (50 miles) per hour. Their 'plane was violently buffeted about, and their fuel consumption considerably increased. In an interview after landing, the airmen declared that they had been obliged to fight against this storm continuously all that night, without a moment's rest, and they finally decided to come down at 10.22 a.m. Sunday morning, after being, as stated above, 75 hr. 22 min. in the air.

According to a statement given out by them after their landing, the 600-h.p. Hispano-Suiza motor had consumed 5,875 litres (1,305 gallons) of petrol and 45 litres (10 gallons) of oil during the flight, 375 litres (83 gallons) of petrol, and 185 litres (40 gallons) of oil still remained in the tanks of the 'plane, which would have enabled them to continue their flight several hours more had they so desired.

Bossoutrot and Rossi further declared that they intended, after making some slight changes in the Bleriot 110 to "take off" from New York sometime next June, and traversing the Atlantic to continue on a long-distance flight to Siberia.



THE BLERIOT 110 : Side view of the long distance monoplane on which Bossoutrot and Rossi established the duration record.

They are confident that they will be able to traverse 11,000 to 12,000 km. (6,900 to 7,500 miles) in their plane.

The Bleriot 110 'plane used in this flight is one of the new machines ordered by the Service Technique when the French Air Ministry was created about 2½ years ago. It is a monoplane specially designed for long-distance flights, being light in weight and well streamlined. The wings are braced by two steel rods on each side of the fuselage, which is almost elliptical in form.

The longerons and ribs are of spruce covered with plywood. The fuselage is of "monocoque" construction made of tulip wood. The pilots' seats are installed in tandem, and have a double control. A berth for sleeping is mounted behind them. The fuel tanks, which have a total capacity of 7,200 litres (1,600 gallons) are installed in the central portion of the wings, and also in the fuselage.

The Hispano-Suiza engine fitted in this machine is a 12-cylinder water-cooled "V" (60°), with a bore and stroke of 140 mm. and 170 mm., respectively, and 6.2 compression. The total weight of the engine, empty, is 467 kg. (1,027 lb.), the fuel consumption 219 grams (0.48 lb.) per h.p./hr., and the oil consumption 7 grams (0.015 lb.) per h.p./hr.

The principle characteristics of the Bleriot 110 are :—Span, 26.5 m. (86 ft.); length, 14.55 m. (47 ft. 3 in.). Height, 4.9 m. (16 ft.). Wing area, 81 sq. m. (872 sq. ft.). Weight, empty, 2,500 kg. (6,000 lb.). Fittings and equipment, 400 kg. (880 lb.). Fuel, 4,400 kg. (9,680 lb.). Total weight, 7,300 kg. (16,060 lb.). Maximum speed, 210 k.p.h. (132 m.p.h.). Climb in one hour with a total load of 5,300 kg. (11,660 lb.), 4,500 m. (14,625 ft.). Ceiling, with load of 7,500 kg. (16,500 lb.), 2,000 m. (6,500 ft.). Flight radius (no wind), 12,000 km. (7,500 miles).
R. C. W.



THE BLERIOT 110 : Front view showing the clean lines of this machine.



The New Duration Record

WHEN recording, in last week's issue of FLIGHT, the duration record established by the French pilots Bossoutrot and Rossi, we committed two slips—one the spelling of the former pilot's name, and the other in giving the previous record as 8 hr. 9 min. and 616 km. These latter figures referred to the time and distance by which the previous record was beaten. It may be of interest to add, regarding this new record, that K. L. G. plugs were fitted for this

flight, and "Stanavo" petrol, as marketed by the Anglo-American Oil Co., Ltd., was used. Further details of the flight are given above.

American Airwoman's Altitude Flight

ON March 6, Miss Ruth Nichols, flying for an hour over Manhattan Island, attained an altitude of 30,000 ft. As this exceeds the record of 27,418 ft. established by Miss Eleanor Smith, Miss Nichols' altimeter has been sent to Washington for examination.

NEW AUTOGIROS

THE Cierva Autogiro has already become well known, and even the general public look for the "windmill plane," as they call it, at flying meetings. It is not generally known that great strides have been made with it in other countries besides our own. America, for instance, has been going ahead very strongly, and the Pitcairn Autogiro Co. have produced quite a large number of various types of machines, and photographs of those flying over New York, are quite common in the American press. Among the most recent developments here, is the adaptation of the Autogiro principle to a flying boat, which is being built by Short Bros., of Rochester. This will, of course, be entirely experimental, and should prove extremely interesting, if only as a ferry boat for taking passengers from large transoceanic flying boats and landing them near cities in congested waters. The De Havilland firm at Stag Lane are also building a form of Puss-Moth-Autogiro. This will, in effect, be a foreshortened Puss Moth type of fuselage, and a low wing with up-turned tips and the wide undercarriage of the existing Autogiro. The cabin roof will then rise in a pyramid supporting a three-bladed rotor. This pyramid is faired in, while the tail unit of the machine is of a more or less standard monoplane form. The rotor will be started up by means of a shaft and clutch drive from the engine up through the supporting pyramid, which will do away with the greatly increased drag, due to the box type of tail now in use. Plans for a cabin Autogiro of a larger type, carrying four passengers, have also been laid out, but is not yet being built. It will be remembered that the late Sir Sefton Brancker was extremely interested in this type of machine, and it seems quite possible that he would have severed sufficient red tape to have enabled a demonstration to have been carried out on the Horse Guards Parade.

We were recently favoured with the opportunity of trying out an Autogiro of the latest type, and found it quite simple to handle. It is really very little different from a normal sort of machine to fly, except that one has to get used to the idea of gliding at a very steep angle, although without a high sinking speed. It seems to us that the only point where the Autogiro differed greatly was in its handling on the ground, and it is certainly necessary to know exactly what one is doing, and which way to turn when taxiing, taking-off or landing, otherwise the wind is prone to play unexpected pranks. Contrary to general belief, the rotor does not worry the occupants at all, and in fact, one hardly notices it after the first minute or so. In bumpy weather the



The Autogiro C. 19. Mk. III (Genet Major) flown by Mr. Brie at Heston. (Flight Photo.)

Autogiro seems definitely steadier and more stable than most machines, and to be less affected by gusts. There is no doubt that there is a very satisfactory feeling indeed in flying in a machine knowing full well that should it be necessary to make a forced landing it is possible to do so almost vertically, and that there will be no run at all on landing. Even a tennis court, therefore, becomes a potential landing ground. A member of our staff well known in aeronautical circles, who has always announced his intention of deferring the day for his first flight until aircraft were really safe, was also induced to make a trip, and he is now thoroughly converted to flying, so that no doubt we shall one day, see him celebrating his silver wedding by taking his ticket on this type of machine. One of the latest countries to be interested, is New Zealand, where Safety Flying (N.Z.), Ltd., has been formed to demonstrate the Autogiro, and the first model has recently been flown in Auckland and Dunedin by Sqd.-Ldr. Findlay. The Autogiro Company has followed that admirable principle of not putting up their machine as a commercial proposition, until such time as it was really suitable for everybody, with the result that they have had no adverse propaganda to live down through letting people find out their mistakes for them. The existing Autogiro is even in its present form a machine suitable for pilots of average ability, and no doubt before long we shall see a model placed on the market for general or private ownership.

GUILD OF AIR PILOTS AND AIR NAVIGATORS.

THE G.A.P.A.N. reports that, after some correspondence, the question of commercial pilots becoming exempt from jury service has been further pursued, and the Guild has received an assurance from the Town Clerk of Croydon that the commercial pilots in his district will receive due consideration when the jury lists are next prepared. The matter is still being pursued with a view to total exemption for all commercial pilots; members have been requested to write their summoning officers on the question and to report to the Guild thereon.

The Court has lost the valuable services of one of its members by the departure of Capt. F. Tymms, M.C., for India on the 5th inst. to take up his new position as the new Director of Civil Aviation there. As a parting gift, the Court presented Capt. Tymms with a silver inkstand suitably inscribed.

Out of respect to the late Master, Sir Sefton Brancker, and the deputy-master, Sqdn.-Ldr. E. L. Johnston, and

other members of the Guild who perished in the R 101, the annual dinner has been postponed.

Pensions.—A sub-committee has been formed to consider the whole question of pensions both to persons on the R.A.F. reserve and on duty with commercial firms, and commercial pilots, both from the point of view of (a) superannuation on medical grounds, and (b) pensions on physical disablement.

The Guild would again like to point out to aircraft operators and owners the facilities of its employment bureau. All pilots on its register are fully experienced "B" licensed pilots.

The Johnston Memorial Fund has reached the sum of £50, and the suggestion of the purchase of a cup has been approved.

With a view to assisting candidates for navigators' licences, the Guild has commenced a lending library, where any book required for these examinations can be borrowed at a nominal fee.

Decoration for the Prince of Wales

KING CAROL OF ROUMANIA has bestowed the Gold Cross of the Order of Merit in Aeronautics upon the Prince of

Wales, with the following mention: "His Royal Highness has chosen the aeroplane as his usual means of locomotion, thus giving the most handsome encouragement to aviators."

BRITISH EMPIRE TRADE EXHIBITION BUENOS AIRES

1931

WHEN His Royal Highness, the Prince of Wales, who is accompanied by his brother, Prince George, opens the British Empire Trade Exhibition at Buenos Aires to-morrow, South America will have an opportunity to see for itself much of what is best in British aviation. For the first time in history, there will be at this exhibition a large section devoted to the British Aircraft Industry, while at no great distance away, at El Palomar aerodrome, several types of British aircraft may be seen in actual flight. Moreover, the British aircraft carrier *Eagle* will be the home of a number of the very latest types of Fleet Air Arm machines, in addition to her usual complement of Fairey III F's and Blackburn "Ripons." Thus Great Britain is showing in a very admirable manner what her aircraft industry has to offer, and there is little doubt that as a result, British aircraft and aero engine firms will in the future receive favourable consideration when our South American friends decide to place orders.

The Royal Princes have, as our readers will be well aware, made an extensive tour of South America, during which they have made great use of air transport. In fact, but for the amount of flying they have done, it would have been impossible for the Princes to have visited all the places at which they have called. The Prince of Wales has his own "Puss Moth" in South America, whither it has been transported on board H.M.S. *Eagle*. The example which the Royal Princes have set cannot fail to have a profound effect, and the British Aircraft Industry is, perhaps, more than any other, indebted to the Princes for their untiring efforts.

The "Static" Exhibition

In the Government Pavilion the aircraft section will include exhibits of the products of some of the leading British aircraft and aero engine firms, as well as a historical exhibition of models, lent by the Air Ministry. The British aircraft industry firms which have exhibits in the Government Pavilion are:

Armstrong Siddeley Motors, Limited.

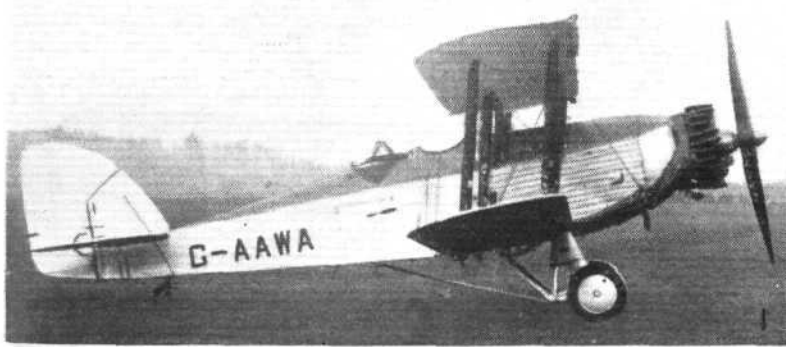
Sir W. G. Armstrong Whitworth Aircraft, Limited.

The Bristol Aeroplane Co., Ltd.
The De Havilland Aircraft Co., Ltd.
The Palmer Tyre, Limited.

A. V. Roe & Co., Ltd.
Rolls-Royce, Limited.
Smith's Aircraft Instruments.
Supermarine Aviation Works, Limited.
Vickers (Aviation), Limited.
C. C. Wakefield & Co., Ltd.

Armstrong Siddeley Motors, Limited.—A complete range of ten air-cooled radial engines is being exhibited, varying from 80 h.p. to 800 h.p., and demonstrating the wide choice of power plants available to customers of this firm. The Armstrong Siddeley engines are already so well known to readers of *FLIGHT* that there is little need to describe them here, but it is worth while pointing out once more that a feature of the Armstrong Siddeley range is interchangeability. Thus the 5-cylinder "Mongoose," the 10-cylinder "Double Mongoose," the 7-cylinder "Lynx," and the 14-cylinder "Jaguar" have cylinders, pistons, connecting rods, etc., identical and interchangeable. In the lower powers the 5-cylinder and 7-cylinder "Genet Major" similar components are interchangeable, as is also the case in the really high powers: "Lynx Major" and "Jaguar Major." With the exception of the "Lynx Major," 5- and 7-cylinder "Genet Majors," and the little "Genet," all the Armstrong Siddeley engines can be supplied with a propeller reduction gear, having a ratio of 0.65 to 1. The "Lynx," "Jaguar" and "Jaguar Major" are available in supercharged form, while in addition the "Jaguar Major" and "Lynx Major" are supplied with a geared fan which provides a moderate degree of supercharging at relatively low altitudes.

Sir W. G. Armstrong Whitworth Aircraft, Limited.—No complete aircraft is exhibited by this firm, but an "Atlas" Army Co-operation aircraft is stationed at El Palomar aerodrome, where it is available for demonstration flights, etc. In the actual exhibition building the Armstrong Whitworth exhibit comprises a front portion of an "Atlas" fuselage (shown in skeleton so as to lay open for inspection



BRITISH AIRCRAFT TYPES WHICH ARE BEING FLOWN AT EL PALOMAR: 1, The Westland "Wapiti," with Armstrong-Siddeley "Panther" engine. 2, Avro "Avian," Hermes engine. 3, Avro Advanced Trainer, type 626, Armstrong-Siddeley "Lynx" engine. 4, Armstrong-Whitworth "Atlas," with Armstrong-Siddeley "Jaguar" engine.



H.M. AIRCRAFT CARRIER "EAGLE": This floating aerodrome will be the home, during the Exhibition, of Hawker "Nimrods" and "Ospreys," and Fairey III F's with "Panther" engine, in addition to its normal equipment of Blackburn "Ripons" and Fairey III F's (Napier). (Official R.A.F. Photograph, Crown Copyright.)

the type of construction used), a lower main plane with aileron, cases of spar and rib sections, and a proof loading test machine.

The proof loading of an "Atlas" spar is demonstrated in the following manner: A 15 ft. length of spar is supported at its ends, and has a load of 500 lb. applied at the centre. The outside fibre stress is 55 tons per sq. in., and the deflection under this load is 6 inches. The spar is 3½ inches deep, and is of the type used in the lower main plane of an "Atlas" machine. To pass the test, the spar must not retain any permanent set when the load is removed. The "Atlas" spar shown in the testing machine has the following dimensions: Thickness of flanges 0.015 in. Thickness of cornices 0.012 in. Thickness of web 0.012 in. Thickness of jointing strip 0.008 in.

The Bristol Aeroplane Co., Ltd.—The "Bristol" exhibit is a fairly small one, consisting of a sectioned "Jupiter" engine and models of the famous "Bulldog" single-seater fighter. The "Jupiter" exhibited at Buenos Aires will be of particular interest to those visitors who have not before had an opportunity to see the internal economy of a radial aero-engine, since it is a sectioned engine driven by an electric motor, and the movements of the working parts, such as crankshaft and camshaft, valves, etc., can be clearly followed.

The "Bulldog," apart from being in use in large numbers in Great Britain, is gradually being supplied to more and more countries, and at the present time it has been supplied for service in no less than nine different countries, including Great Britain, Australia, Sweden, Denmark, Siam, Latvia, and Estonia. For an aircraft to receive unanimous acceptance in any air force, there are three branches which must be satisfied: the pilots must be satisfied with the flying qualities; the maintenance staff must be satisfied with the ease and rapidity with which overhauls can be made; and finally, the administrative authority must be satisfied that the machine is of reasonable cost in relation to the service which it gives and to the durability under ordinary service conditions. From the fact that the "Bulldog" has been delivered to nine countries it would appear that all these points have been successfully attained, and one can only regret that it has not been found possible for the Bristol company to send an actual machine to South America. Models and photographs, although showing

a machine in a general way, cannot equal the actual thing, and either a machine in skeleton in the exhibition or a machine flying at El Palomar would have been preferable.

The De Havilland Aircraft Co., Ltd.—De Havilland's are represented by four machines, two at the exhibition and two at El Palomar. In both cases the machines are a "Puss Moth" and a "Gipsy Moth." Both these are, as FLIGHT readers will hardly need to be reminded, light aeroplanes of types which have become extremely popular all over the world. The first "Moth" may be said to have set a fashion in light 'planes which was followed for several years, while the "Puss Moth" undoubtedly also set a new standard in flying comfort at high speed. Added interest will be lent to the "Puss Moth" exhibited by the fact that the Prince of Wales owns a similar machine, which is actually now in South America. The "Gipsy Moth" exhibited is one of those with all-metal fuselage.

A. V. Roe and Co., Ltd.—By way of demonstrating in a clear and convincing manner the versatility of their Advanced Trainer, type 626, the Avro firm is showing six skeleton fuselages of this machine, each fuselage being exhibited as equipped for one of the many functions for which the type 626 can be used.

The "Advanced Trainer," type 626, is an all-metal biplane, generally similar to the type 621, from which it has been developed, and is fitted with the 215-h.p. Armstrong-Siddeley "Lynx" engine. The fuselage is arranged to accommodate alternatively the armament and equipment for each of the following separate and distinct branches of training: offensive gunnery (pilot's fixed gun), defensive gunnery (observer's gun), bombing, wireless telegraphy, aerial photography, navigation, and flying training.

Although it is possible to change the equipment of one duty for that intended for another duty in a relatively short time, say, two hours, the designers have based their design on the assumption that in practice the advance training school will employ a series of 626 machines, each being fitted with the equipment for one particular branch of training.

Rolls-Royce, Ltd.—But one engine is shown by Rolls-Royce. This is one of the "F"—or, as it is now called, "Kestrel"—type, and is sectioned to show the internal working parts, such as reduction gear, pistons, valve-operating mechanism, supercharger gear train, rotor and diffuser, and auxiliary operating gear. The Rolls-Royce "Kestrel"



DE HAVILLAND REPRESENTATIVES: Four machines are shown by this firm, two in the Exhibition and two flying at El Palomar. In both cases the machines are a "Gipsy-Moth" and a "Puss Moth."

engine has, during the last few years, established an excellent reputation as a highly efficient power plant for aircraft, and is used in such modern high-performance machines as the Hawker "Harts" and "Furys," the Fairey "Firefly," etc., as well as in such flying boats as the short "Singapore II" and Blackburn "Sydney."

Supermarine Aviation Works and Vickers (Aviation) Ltd.—The combined exhibit of these two firms consists of models, transparencies, cinema films, and a full range of Vickers aircraft accessories. The machines depicted by transparencies and/or cine films include the following types: "Vildebeest" torpedo bomber, "Viastra" twin-engined passenger monoplane, "Victrix" twin-engined high-speed freight carrier, "Vespa" Army co-operation biplane, Vickers Interceptor Fighter, Supermarine "Southampton" twin-engined flying boat, Supermarine "Sea Hawk," the six-engined monoplane flying boat now being built for Imperial Airways, and the S.6 Schneider Trophy monoplane, the world's speed record holder with 357.7 m.p.h.

The Palmer Tyre, Ltd.—The name of Palmer has been associated with aviation since the earliest days, and at Buenos Aires visitors will have the opportunity to inspect a very complete range of Palmer landing wheels, eight in all, of



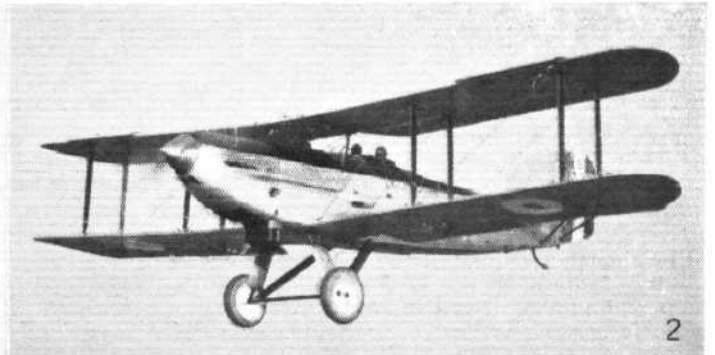
THE ROYAL "PUSS MOTH": The Prince of Wales' aeroplane crated for transport to South America in H.M.S. "Eagle."

which seven are fitted with the very ingenious pneumatic brake introduced by the Palmer company a few years ago. The Palmer exhibit also includes a demonstration model showing how this brake mechanism works. It may be recalled that this makes use of a pneumatic tube interposed between the moving and fixed parts of the wheel, so that when the tube is inflated it makes contact with both surfaces and establishes a very smooth and yet positive braking action.

Smith's Aircraft Instruments.—As usual, "Smith's" are well to the fore at Buenos Aires, where display

panels carrying various combinations of instruments are exhibited. These instruments include air-speed indicator, vertical magnetic compass, revolution counter, altimeter, clock, turn indicator, thermometer, oil-pressure gauge, and cross level. The Smith exhibit is completed by a representative series of K.L.G. plugs and single exhibits of other devices, including aperiodic compass, course and wind calculator, wind gauge, course-setting bomb sight, wind direction indicator, slide rule, and sextant.

C. C. Wakefield and Co., Ltd.—Wakefield's sole agents in Argentina, Thornton, Evans and Co., display specimen tins and exhibit samples of each of the "Castrol" grades recommended for aero engines by all the leading makers.



AIRCRAFT TYPES TO BE SEEN IN THE "EAGLE": 1, The Blackburn "Ripon" with Napier "Lion" engine. 2, the Fairey III F, also with "Lion." 3, The Hawker "Osprey," with Rolls-Royce "Kestrel" engine. 4, The Hawker "Nimrod," also with "Kestrel" engine. 5, The Fairey III F, with Armstrong Siddeley "Panther" engine. The first two types are standard equipment in the "Eagle," while the last three types are extras, included to show the South Americans some of our most up-to-date aircraft. (FLIGHT Photos.)



MAR DEL PLATA : An aerial view of the fashionable Argentine summer resort where the Prince landed on March 4. Our picture shows the famous "Pigeon Club" and the private landing stage.

At El Palomar

El Palomar aerodrome has been placed by the Argentine military authorities at the disposal of British exhibitors, and here a number of British aircraft are being demonstrated before interested parties. The British firms of Armstrong Whitworth, De Havilland, Avro and Westland have machines at El Palomar, and, in addition, certain of the new aircraft types from H.M.S. *Eagle*, have been brought ashore and erected on the aerodrome, where they have created a very favourable impression. The Hawker "Nimrod" in particular appears to have impressed the spectators by its astounding performance and good manoeuvrability.

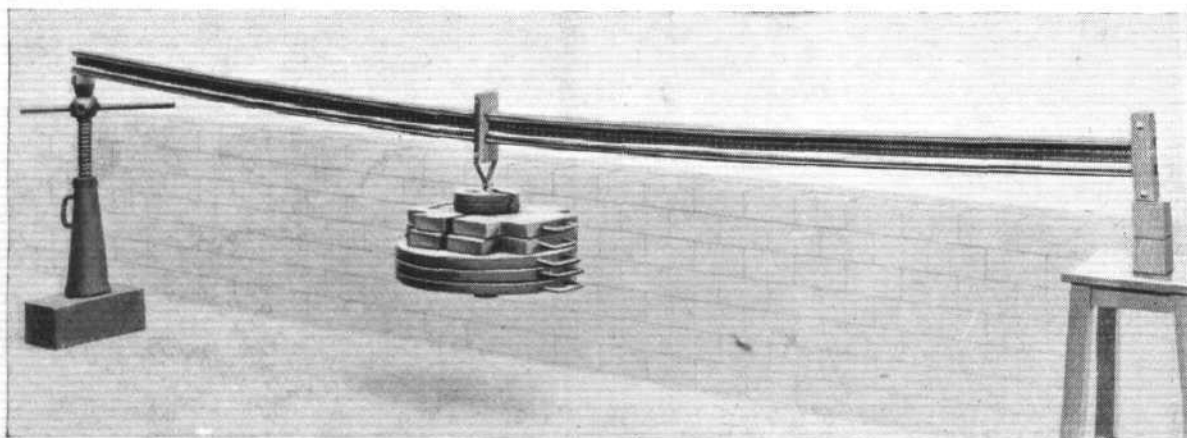
The machines permanently stationed at El Palomar during the exhibition are an Armstrong Whitworth "Atlas" general-purpose two-seater aeroplane, a De Havilland "Gipsy Moth" and "Puss Moth," an Avro Advanced Trainer, type 626, an Avro "Avian" light plane, and a Westland "Wapiti"

general-purpose two-seater with Armstrong-Siddeley "Panther" engine.

Aircraft on Board H.M.S. "Eagle"

H.M. Aircraft-carrier *Eagle* has been sent to South American waters during the Buenos Aires exhibition, and will there serve as a base for certain new aircraft types as well as for her own normal complement of machines. The *Eagle* is normally equipped with Fleet reconnaissance machines and torpedo-planes, the type used as standard in the former class being the Fairey III F with Napier "Lion" engine, while the torpedo-planes are Blackburn "Ripons," also with Napier "Lion" engines.

In order to give the South Americans and visitors from other parts of the world an opportunity to see some of the very latest types of Fleet aircraft, H.M.S. *Eagle* carries, in addition to her normal equipment, a composite flight of



ON THE ARMSTRONG-WHITWORTH STAND : The wing spar proof loading test machine.

machines of the latest types—types, in fact, of so recent production that they have not yet been issued to the Fleet Air Arm. This composite flight takes the place of the single-seater fighter flight normally carried on the *Eagle*, and consists of the new Hawker "Nimrod" single-seater fleet fighter with Rolls-Royce "Kestrel" engine, the equally new Hawker "Osprey" two-seater fleet fighter, also with Rolls-Royce "Kestrel" engine, and the high-performance Fairey III F with Armstrong Siddeley "Panther" air-cooled engine. Each in its own class these machines are far ahead in performance and general excellence of any foreign aircraft ever demonstrated in South America, and their evolutions from the *Eagle* and from El Palomar cannot fail to raise British aircraft prestige in South America.

Altogether the British aircraft industry can be congratulated on having made a very praiseworthy effort to demonstrate by concerted action the high qualities of British aircraft and British aero engines, and if orders are to be placed by South American nations during the near future there is little fear of British claims to recognition being overlooked.

The Princes in the Argentine

ON March 4, T.R.H. the Prince of Wales and Prince George arrived by train at San Antonio on the southern coast of the Argentine. There they embarked on a British aeroplane and flew on to Camet aerodrome, 10 miles from Mar del Plata. The latter place is the chief seaside resort of the Argentine, and is some 250 miles away from the capital. They were escorted on the flight by a dozen British aircraft from H.M.S. *Eagle*. Next day the flight was continued to Buenos Aires, where a landing was made at El Palomar aerodrome. The first machine of the escort to arrive was the "Nimrod" (the fleet version for the "Fury") which performed some aerobatics. Then came a formation of three machines, in one of which was the Prince of Wales and Lord Ednam, piloted by Flight-Lieut. Doon, while Prince George was in the second. They were escorted in by 23 aeroplanes of the Argentine flying corps. On Saturday, March 7, the Princes visited the aerodrome and inspected the machines. The "Nimrod" gave another fine exhibition of aerobatics. Great enthusiasm was shown by the crowds.

AERONAUTICS IN THE ARGENTINE

By C. RIVERS ANDERSON

THE huge British Industries Fair opening this week in Buenos Aires brings all phases of trade with that country into unusual prominence.

In investigating the markets in Argentina for aircraft, a Commissioner of the Canadian Government reaches the conclusion that flying in that part of the globe opens opportunities for export trade by Great Britain as well as by Canada. British business with the Argentine has of course been developing for a good many years, though the "balance" has been decidedly in favour of the Argentines.

That greater equality in this respect will result from the visit of the Prince of Wales, is the expectation of British business men. An exchange of £30,000,000 of British manufactures for £80,000,000 of Argentine foodstuffs (to cite maximum figures in the past decade), even though supplemented by a return to this country of £25,000,000 a year by way of interest on British capital, is not as favourable an exchange, from the standpoint of this country, as it might be.

In view of the undoubtedly great future for aeronautics in the Argentine it would therefore seem that British exports in this connection could be considerably expanded. Rail travel in that country is slow, and the principal cities and towns some distance apart. Private flying is still unorganised, and although the Government has subsidised certain flying clubs, little interest has been shown in this means of transportation and sport, though that will come in time. Many wealthy people own large estates in the interior, and with poor roads it is frequently difficult for them to reach their estancias without considerable delay and inconvenience. A small plane would be ideal, as the country generally is admirably adapted for flying. Interest is gradually being aroused by companies which operate machines for private hire, and several commercial concerns have tentative plans for employing aircraft for quick transport, where large areas are to be covered.

Types of Aeroplanes in Use

Attention is now given to aerial surveying and photography. An enterprising British Company in Buenos Aires has obtained a number of important contracts, which may lead to other business in that part of the world. There are six active and ten dormant flying clubs. These were subsidised by the Civil Aviation authorities, indirectly a branch of the Government, who assist in furnishing instructors, aeroplanes and material, mechanics and aerodromes. For reasons of economy, however, this assistance has been discontinued for the present, and general interest in private flying is only in its infancy.

The principal type of machine used in civilian flying is the light two-seater plane, with a few small cabin machines carrying two to four passengers. There are De Havilland Moths, Avro-Avians, Fleets, Curtiss J.N.O.X.'s, Orioles, Meteors and Robins, Waccos, Traels, Klemms, B.F.W.'s,

Sopwith, Bellanca, Ryan, Lockheed Vega, American Eagle, Desoutter, and Caudron in use.

Until recently the Argentine Government operated an aircraft factory at Cordoba, but apparently for reasons of economy this has been closed down. At this factory the Government, under licence from different companies, manufactured and assembled certain machines for their own use, and it served also as an instruction centre. In view of the unsatisfactory conditions in which the Army planes are at present, with the Cordoba factory closed down, it is expected that if replacements are made, they will be purchased direct from the manufacturers. The Army up to now has favoured the French aeroplane, the Dewoitine; but Bristols, Avros, and a few others, are used as well. The Navy, on the other hand, will probably not be in the market for some time. In 1928 they favoured Great Britain in their purchases, but machines of French, United States and Italian origin are also used.

An Objective to be kept in Sight.

The Curtiss Company have an assembly plant at San Fernando, where they receive machines on consignment. This and the Cordoba plant of the National Aircraft Company are the only domestic plants in Argentina. Up to the present no duty has been charged on aircraft, aero-engines, or spare parts.

The daily increasing confidence of the public in aircraft transportation has had a great influence on its development. Yet Argentina has not made the progress in domestic lines on a commercial basis that might have been expected, with ideal weather and land conditions, for the establishment of air lines for passengers, merchandise and mail. Considering the last-named, it is worthy of note that Argentina has the greatest coefficient of *per capita* coastal traffic in the world with 224, and the United States is second with 214, so that in this branch alone there are possibilities of development.

The steamships carry weekly about 12 tons of mail north-bound and 38 tons southbound. Fogs are not a serious handicap; in fact on the international services to North America they are unknown along 80 per cent. of the routes. The voyage by steamer from Buenos Aires to New York requires 18 to 20 days. The trip by air is made in seven days, covering 8,000 miles, and as time goes on it may be reduced to four. It is evident, therefore, that this traffic has possibilities, especially as the majority travelling by this route are business men who want speed, and not tourists who desire to travel in a more leisurely fashion.

The inauguration of the international services and their subsequent development may play a prominent part in cementing commercial and cultural relations between the countries along the established routes and those which may materialise in the future. A regular service via the South Atlantic and Great Britain should thus be an objective of the near future.



GLIDING

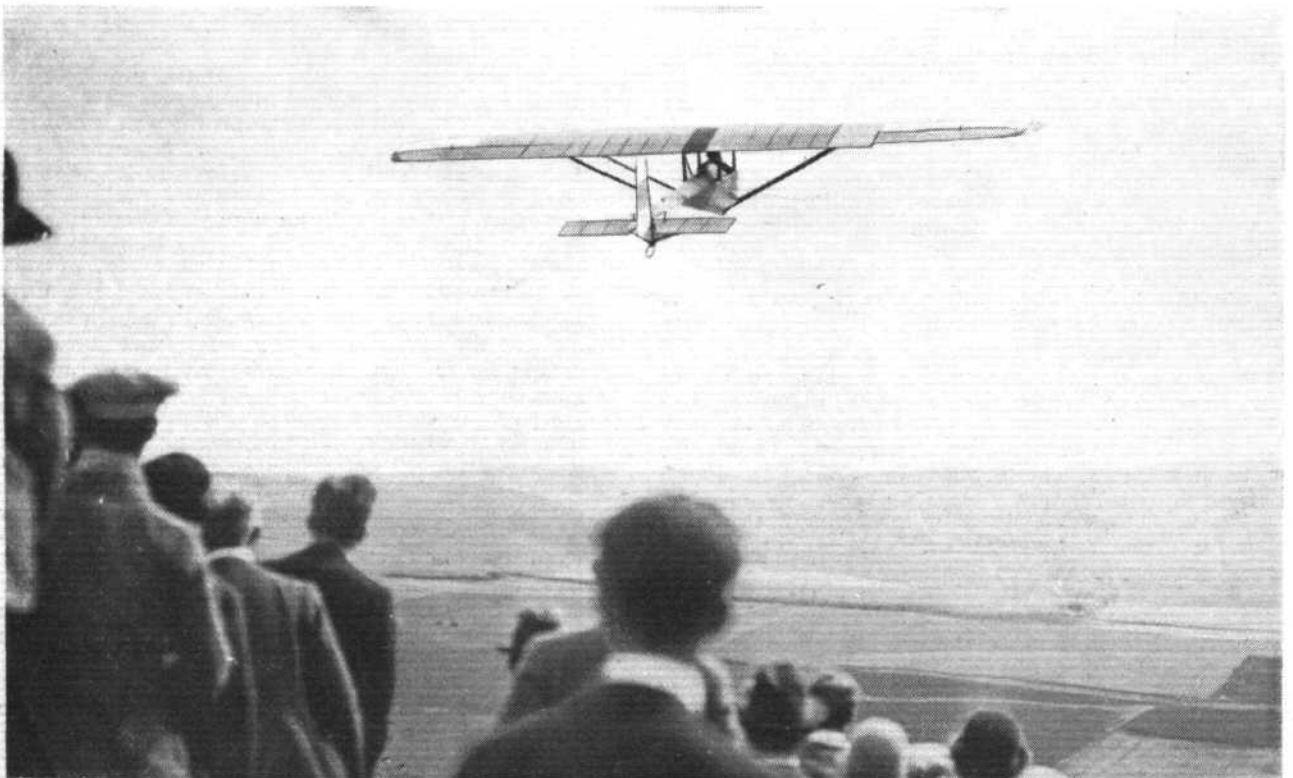
NORTH KENT GLIDING CLUB offer the following information as to the mistakes they have made in the past in order that newcomers shall not do the same. At the beginning of their training they were very enthusiastic and used an efficient machine and sent their members off after only one or two slides, with the result that crashes were numerous and the repair bill high. They have now instituted a scheme whereby every member without exception has to make 10 slides before leaving the ground. They use a long single rope which makes long slides of 100 yards possible without the sudden acceleration system with the "V" method. A car is used to replace the crew, with 50 ft. of hemp rope between the rubber cord and the car. It is only necessary to drive the car at from 5 to 8 m.p.h. except in one case, when their heavy-weight pilot needed a speed of 10 m.p.h. to get him moving. On Sunday, February 22, they achieved 76 slides in five hours, and members were thereby enabled to master the control of the glider thoroughly.

THE SOUTHDOWN SKYSAILING CLUB were unable to do any gliding on Sunday, March 1, on account of the high wind. Their committee has decided to grant "one day memberships" for the sum of 5s. to visitors who wish to take part in the club's activities, while a ground fee of 6d. per day per head will in future be charged to cover the cost of mechanical traction.

HERTS AND ESSEX Gliding Club have had a change in their Secretary, who is now R. D. Gerrans, of Collins Cross Motor Co., Stanstead Road, Bishops Stortford, Herts, and Mr. Dockray is the new chairman. They have acquired a new flat field, and hope, in the near future, to undertake some auto-towing.

SOUTHEND-ON-SEA is now forming a gliding club, and those interested from the surrounding district, are invited to communicate with Mr. J. H. Richardson, 43, Northview Drive, Westcliff-on-Sea.

A REGRETTABLE ACCIDENT.—On Sunday, March 8, Mr. T. E. Lander, of Harpenden, was killed at Faulkners End, near Harpenden, while making a first test flight of a new type of glider launching apparatus. Mr. Lander was one of the most enthusiastic members of the Harpenden group of the London Gliding Club, and was something of a pioneer. He was one of the first to own a Prüfling type of glider himself, and had latterly been perfecting the use of motor power for launching gliders. We are told that the method he was trying was not auto-towing, but consisted of a drum on the engine shaft of a motor car working through a tackle in such a manner as to gear up the speed of the rope at the end where it was attached to the glider. The machine used was the "Scud," which has often been criticised as being exceptionally sensitive on the elevator control and from the information at present available it appears that the acceleration imparted to the glider was so great that Mr. Lander experienced a "black out" and then presumably dived straight into the ground. There has been no suggestion of constructional failure. We understand that several previous attempts have been made with modified forms of this launching apparatus, but they had all been found to be too slow, and this gearing up had been designed to overcome this defect. Mr. Lander's death is very much to be regretted indeed, since he was a very keen advocate of gliding and devoted a great deal of his time and money to its furtherance. The accident bears out the attitude which we have at all times taken with regard to auto-towing and mechanical launching, for it is certain, as we have pointed out before, that although there are in all probability very great possibilities in either auto-towing or mechanical launching, yet it is quite certain that accidents will occur unless the car is under the control of an exceptionally careful instructor. In this case of course, Mr. Lander was taking a risk which he would probably have advised others not to take, since the scheme was new and untried, and such accidents are the type upon which the foundation of our experience is built up, and which unfortunately occasionally happen before things can be made safe for others. We would like to express our sympathy with Mrs. Lander and her children, and also with all Mr. Lander's many friends in the gliding movement.



WELL AWAY: Mr. I. C. Weale in a Prüfling at Ivinghoe Beacon on the occasion of a match between the Lancashire Gliding Club and the London Gliding Club. (Flight Photo.)

PRIVATE FLYING & CLUB NEWS

THE MEETING AT AMSTERDAM.—On Saturday, March 7, there was an excellent flying meeting held at the Schiphol aerodrome at Amsterdam. The proceedings opened with a luncheon given by the National Aero Club in the K.L.M. restaurant, and thereafter a flying programme, somewhat similar to that which one sees at English meetings, was carried through. There was some exceptionally fine formation flying by five pilots of the Dutch Air Force on their Fokker two-seater fighters, which was all the more remarkable for its precision and excellence, as there was a very heavy wind blowing making the air very bumpy indeed. Their tight turns in Vee formation were particularly good, and so regular was their station keeping that the formation almost looked like a large Pterodactyl! After some flying displays by members of the club and others, Capt. H. S. Broad was down on the programme to give a demonstration on a Puss Moth, followed by crazy flying on a Hermes Moth by Mr. R. R. Bentley. Unfortunately, Capt. Broad did not arrive, so Mr. Bentley, who had flown over during the morning, together with Mrs. Bentley, in the Shell Company's beautifully coloured gold and red Puss Moth (Gipsy III) G-AAXY, stepped into the breach and carried through an excellent demonstration. Particularly noticeable was his control of the machine at low speeds, and his demonstration of the short run with which the machine can be landed when necessary. The high east wind and general bad weather had probably deterred other English visitors, and, apart from Mr. Bentley, the only other to arrive was Mr. Maurice Jackaman, also in a Puss Moth. Great interest was shown by everyone there in these two representatives of British aircraft, and during the whole week-end people were vying with one another to obtain a close view.

THE PUSS MOTH in Canada.—The Puss Moth seems to be an increasingly liked machine among private owners in Canada, and Mr. Loader, the General Manager of the De Havilland Aircraft Co. of Canada, Ltd., of 372, Bay Street, Toronto, reports that recently, Mr. William Archibald arrived there having come from Fort William, about 1,000 miles away. He says that Mr. Archibald uses his machine constantly for his business, and has been flying it with satisfaction since August last.

DELHI FLYING CLUB have the distinction of training the first Indian gentleman to take his "B" licence. This is Mr. Bhagat B. Lal, who was also the first Indian pupil to take his "A" licence with the club. On January 21 a farewell dinner was given jointly by the Aero Club and the Delhi Flying Club to Lt.-Col. Shelmerdine, on his vacating the post of Director of Civil Aviation in India. During the month of January club machines flew a total of 152 hrs. 20 mins.

AN OFFICIAL AFTERNOON.—The Committee of Hanworth Club entertained the members of the Council of the Royal Aeronautical Society together with Lord Stonehaven, late Governor-General of Australia, Admiral Sir Reginald Tyrwhitt, D.S.O., Bt., Commander-in-Chief, Nore, Commodore A. L. Snagge, Captain of the R.N. Barracks, Chatham, to luncheon at Hanworth last Sunday, March 8. This was the second of a series of such invitations which are being extended to a large number of prominent public bodies, in order to popularise Hanworth club and to make it known amongst those people who matter. After lunch the party were treated to a display of flying while all the club machines under Capt. Max Findlay were arranged out for their view.

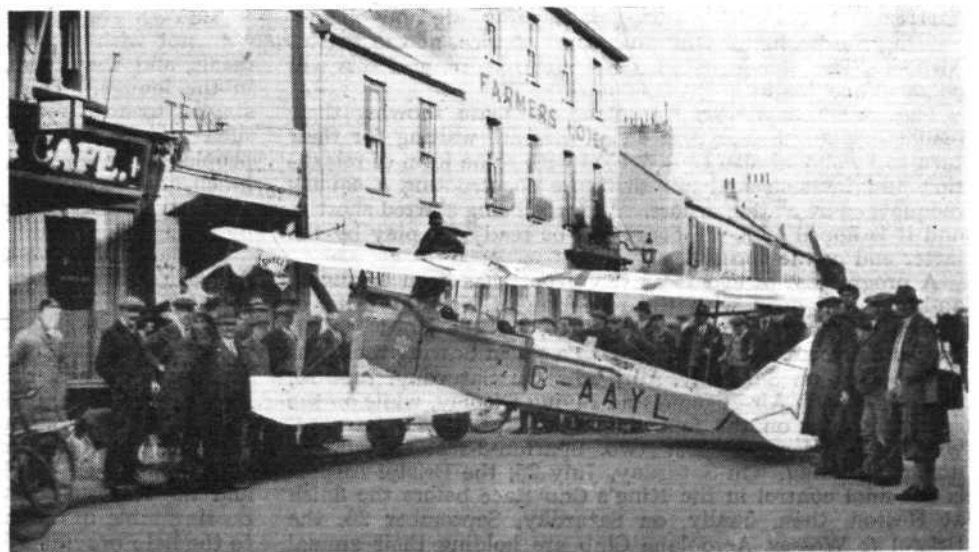
Mr. Brie, the second test pilot of the Autogiro Co., Ltd., came over from Heston and gave a display. He took up many passengers, including Admiral Tyrwhitt, while many of the other visitors were also shown Hanworth from the air in a Desoutter. One of the latest attractions at Hanworth is a game which seems to be a combination of miniature bagatelle or billiards called Banking. It is very much like a miniature golf course laid out on a small billiard table, and judging by the interest it caused on Sunday, it is likely to rival the already firmly established ping pong table in the club.

THE BRISTOL AND WESSEX Aeroplane Club held their annual dance at the Grand Spar Hotel, Clifton, on Thursday evening, February 26. There was a model aeroplane race, for which prizes were given, and an attendance of over 200. Mr. Downes-Shaw, Chairman of the club, was there, together with Mr. A. R. Fedden, Mr. Ashley Hall, Capt. Winters and Mr. R. R. Bentley.

THE MADRAS FLYING CLUB.—This Club only started their operations last July, but the latest reports would seem to indicate that they have made very good progress. During these seven months four members have taken their "A" licences and three others have passed their tests. One member, Mr. Avadaiyappa Chettiar owns the first Blackburn Bluebird to be imported into India.

The number of members at present stands at 213, including 116 Indians, 93 Europeans, and 4 firms. Of these, some twenty are flying members and twelve are under instruction. The two machines which have been used up to the present have been found insufficient to cope with the demand for instruction, and a third is therefore being purchased, while negotiations are in progress to obtain a second instructor from England. The Madras Club is the only one actually flying in the south of India and it is anticipated that they will soon be catering for their *mofussil* members by giving instruction in Bangalore and Trichinopoly as well as at Madras.

Will this sight become common? A D.H. Gipsy Moth filling up at a Shell pump in a Jersey street. Jersey has no landing ground, so F./O. D. V. Ivan landed on the beach between First Tower and Millbrook, then folded the wings and brought the machine to a local garage, where he had it refuelled from a Shell pump. Aeroplanes do not attract much attention today, but judging from the crowd that gathered about the machine whilst refuelling, the novelty of fuelling a machine in the same way as cars are fuelled aroused considerable local interest.



AIRPORT NEWS

CROYDON NOTES

THE weather for the week was very good and every service was run to schedule without exception. Friday and Saturday were bitterly cold, and noses shone with about the same power as the Neon light. The hotel was not responsible for this state of affairs.

It is very seldom we get a mystery at Croydon, but we certainly have one now. On Sunday, March 1, a machine G-AACL, piloted by a Mr. C. Job left Paris about 10.30 for London. I understand that the authorities knew nothing of this departure until the Monday morning following, when Capt. Duncan Davis of the Brooklands School, came over specially to obtain news as he was expecting this machine. Enquiries were at once made, with the result that there was no news anywhere in France or England since the departure on the Sunday from Paris. Since then, not a word has been heard of the machine or pilot, and it seems that there is only one conclusion to be reached. It is known that about the time he should have been over the Channel, a fierce snow-storm was raging. It seems to be another case of the private pilot ignoring the facilities that are available. He apparently left Paris without a word to anyone, consequently not a soul at Croydon knew of his departure, so no help could be sent to the pilot if he was in difficulty. Why will some private pilots be so adamant? The Air Ministry has an excellent scheme to assist pilots in reporting their safe crossing of the Channel, and yet only a few avail themselves of it. Safety first should be their policy even if they never require the help this scheme offers. I know many of the Air Ministry officials at Croydon are pretty sick about the question of these private pilots, they are often the cause of endless trouble.

On Tuesday, the French ladies ice-hockey team returned to Paris, by Air Union. They had the cup with them, and appeared to be more than pleased with the outcome of their visit.

Early on Friday morning, when all respectable people were asleep, Mr. Gordon Olley, of Imperial Airways, took off an Argosy for a flight over London, with some of the staff of the General Electric Company of London. The party was headed by Mr. Ritchie of the above company, who is also a member of the committee on aerodrome lighting. This is about the first flight by night of this nature. The Argosy was booked in the usual way and was purely a private flight. For the local residents sake, we hope the idea will not catch on, until we get silent engines at least.

According to a morning newspaper, when the new 40-seaters come on service they are to carry stewardesses. 'One cannot see the idea at all, as this is essentially a man's job, unless they intend to carry both a steward and stewardess, which will mean cutting down the paying load of the machine.

At the recent dinner given to Colonel Shelmerdine by the Guild of Air Pilots and Air Navigators. Mr. Handley Page made a statement which should not be allowed to pass unchallenged. Referring to wireless on aircraft, he stated that it was all that a pilot had to rely on, and that it was always going wrong. That statement is liable to give a wrong conception to the public as it is very far from the truth, and it is surprising to hear such an utterance from a man like Mr. Handley Page. If he got in touch with the majority of pilots or any of the officers in the Control Tower, he would soon realise the futility of his statement. Pilots and all connected with the wireless part of the business will tell him that it is the biggest boon and blessing that aircraft can have, and that it very seldom goes wrong. It would be no exaggeration to claim 95 per cent. efficiency for wireless. Could the services be kept to schedule day in and day out in all weathers were it not for wireless communication? If Mr. Handley Page will cast his mind back a few years, compare the services then and now, he will get convincing proof.

The Air Ministry in its many efforts to assist pilots of commercial aircraft has now decided, we understand, to erect an equi-signal wireless aerial beacon at Croydon. This should certainly be of great help in bad weather, but I wonder what the local residents will say if it should happen to interfere with their broadcast programmes.

Bridal couples seem to be using the airways in increasing numbers; hardly a week passes unless one or more set out on the "For better or worse" journey. One couple were so anxious to get away this week that the bride came away without a hat or handkerchiefs.

Mr. Campbell Black left early on Friday morning with a passenger for Nairobi, Kenya. He was flying a new Puss Moth, and he speaks very highly of this machine. Wilson Airways, of which firm he is managing director, must now have quite a large fleet of aircraft.

Business is getting brisker, and everyone here has an optimistic outlook for the coming season.

The traffic figures for the week were: Passengers, 452 tons; freight, 34 tons.

P. B.

BRISTOL AIRPORT

PHILLIPS & POWIS, LTD., of Reading, are now operating the beginnings of an airport service, at the Bristol Airport. They have placed a Desoutter there, and this will be available for hire at short notice.

The Bristol & Wessex Aeroplane Club are showing their realisation of the fact that those who are waiting for their turn to fly should also be provided with some form of relaxation and interest, and are therefore constructing a squash racquets court at the airport. Work is being started shortly, and it is hoped that the court will be ready for play by the latter end of the spring.

A programme of events at the airport has been arranged, and this will open with the reception of No. 501 (City of Bristol) (Bomber) Squadron, R.A.F., by the Lord Mayor, who will present the Squadron with a shield bearing the Arms of the City, on Saturday, April 25. On Saturday, June 20, there will be an Air Pageant and Flying Display, while on the same day and on the following one, Capt. C. D. Barnard, with his Spider and the two Spartan-3-seaters, will be doing joy-riding. On Saturday, July 25, the Bristol Airport is the final control in the King's Cup Race before the finish at Heston, then, finally, on Saturday, September 26, the Bristol & Wessex Aeroplane Club are holding their annual Garden Party.

AN INNOVATION AT HESTON

HESTON Air Park has started catering for those who do not wish to spare the time for sitting down to their meals, and they have, therefore, established a sandwich bar in the lounge. This was opened recently, and immediately started to do a roaring trade. We have always advocated such a measure at aerodromes like this, where, so often, people are in hurry, and do not wish to wait for a proper lunch, and we have no doubt that such a measure will increase greatly, the popularity with which Heston is already viewed by flying people.

Readers will have seen from our List of Privately-owned Aircraft that the number of these is increasing very rapidly, and it is not surprising, therefore, that a well-run aerodrome, such as Heston should be among the first to benefit by this fact. The growth of their range of lock-up hangars for such aircraft has really been one of the most astonishing things in recent aviation. Every time we go down there, there seems to be work going on to increase this range, and as far as we can see, the present three hangars are all completely full. This must surely be a satisfactory sign of the times and augurs well for the future of light aircraft. The new bearing table in the lounge is a greatly appreciated addition to the help provided for the private owner and saves much work with ruler and protractor.

AIR TRANSPORT

AIR MAILS AND LONDON CHAMBER OF COMMERCE

Deputation to the Secretary of State for Air

LORD AMULREE, Secretary of State for Air, who was accompanied by Mr. Montague, Under-Secretary of State, Lieut.-Col. Shelmerdine, Director of Civil Aviation, Mr. Holloway, Principal Assistant Secretary, Air Ministry, Mr. Reynolds, Principal Private Secretary to the Secretary of State for Air, and Mr. Burkett, Directorate of Civil Aviation, received, on Friday last, a deputation from the London Chamber of Commerce, led by the President, Lord Herbert Scott. The other members of the deputation were:—Colonel the Master of Sempill, Chairman of the Civil Aviation Section of the Chamber, Sir Robert McLean, Deputy Chairman of that Section, and Mr. A. de V. Leigh, Secretary of the Chamber.

Lord Herbert Scott referred to the deputation from the Chamber to the Postmaster-General last December, when the Minister intimated that certain proposals relating to the institution and extension of air mail services were matters for the consideration of the Air Council rather than of his Department. Lord Herbert remarked that the Chamber realised that the dividing line between the Post Office and the Air Council on questions concerning air mail development was a fine one and that points such as the reduction of air postal fees and proposals for the institution of a $\frac{1}{4}$ -oz. weight for air mail letters concerned the Post Office perhaps more than the Air Council, but at the same time, the Chamber was anxious that the Air Council should be fully informed of its views on the subject as a whole.

Night Air Mail Services

The Master of Sempill dealt with the proposal for the institution of non-stop night air mail services to important Continental centres about 1,000 miles distant from London, which had been put forward last year. Whilst it was believed, he said, that there was at present no machine actually in existence capable of covering the mileage suggested without a stop, the design and construction of such a machine was immediately feasible. Moreover, as the Postmaster-General had stated that a conference was to be held this year on the subject of night air mails, when fresh data would be produced, the Chamber contended that experience ought to have been gained by British Air Transport companies by the institution of night services similar to those which had already been initiated by other countries. It was felt that an experimental night air service to the Continent, within the capacity of existing machines, should be started as soon as possible. In fact, such a service could be run with existing aircraft which could be modified for night flying at a very small cost.

The Master of Sempill added that, so far as regularity was concerned, a point on which the Post Office laid great stress, figures showed that in the operation of one foreign experimental service during 1930 the regularity was greater by night than by day.

Air Mail to India

Sir Robert McLean said that the present saving in time by the Indian air mail service was not great enough to be of real advantage to the business man in India or in this country, whilst the charges were too high to attract the general public.

In this connection, Lord Amulree enquired what the Chamber considered a reasonable fee for a letter to India.

Lord Herbert Scott replied that 3d. would be a fair figure. The Chamber felt that air mail could only be popularised when charges had been reduced to a point where the public would think of the air mail as a normal method of dispatch and not as an emergency service. It was largely a matter of psychology. Sixpence in the mind of the public was not a postage rate. It was realised that the only way to reduce the charge was to reduce the initial weight, and for this reason the Chamber had advocated the introduction of the $\frac{1}{4}$ -oz. unit of weight with a corresponding reduction in charge.

Sir Robert McLean, continuing, pointed out that the

average speed in summer on the Indian route between London and Karachi was about 28 m.p.h., the low average being due to the combined passenger and mail service. Mails ought not to be kept stationary for approximately 16 out of the 24 hours merely because they had to travel at the same rate as passengers. The Chamber was very definitely of opinion that the principle of the separation of passengers from mail should be recognised, and that where traffic did not justify separate passenger and mail services over the same route, a mail service, operating on a 24-hour schedule, should be given precedence.

As it was generally recognised that air mail services could not function without Government assistance at present, it might be necessary to amend the Air Transport (Subsidy Agreements) Act, 1930, which apparently only authorised the payment of subsidies towards the maintenance of regular services for the carriage by air of passengers, goods and mails, in such a way as to authorise the President of the Air Council to pay subsidies for the carriage of mail alone.

Sir Robert suggested that it was possible that some acceleration, even on the present basis, could be made by the use of machines with a greater average cruising speed than those now in use, but it was the Chamber's view that no adequate solution of the problem would be found until the air mail to India was put on a 24-hour schedule. As this would involve the lighting of routes, it was suggested that a plan for Empire air mail services should be prepared so that the necessary work involved in lighting the routes might be put in hand immediately. Were this done, a reliable and regular $3\frac{1}{2}$ -day schedule to Calcutta, $7\frac{1}{2}$ to Sydney, and $8\frac{1}{2}$ to Wellington should be well within the limits of possibility, and there was no doubt that such a saving in time would lead to a much greater use of air mail facilities by business men in Calcutta and other important centres, as they would be relieved of quite half their telegraphic expenditure.

Sir Robert concluded his remarks by expressing the Chamber's concern at the delay which had occurred in the further extension of the Imperial air route to Australia. As it was understood that the Indian Government now proposed to continue the service across India from Karachi to Calcutta as an Indian State service, the Chamber ventured to urge upon the Air Council the desirability of putting into operation at an early date that portion of the route lying between Calcutta and Australia.

Secretary of State's Reply

Lord Amulree said that he personally had much sympathy with the views of the Chamber with regard to the desirability of this country developing efficient day and night air mail services and thus taking full advantage of the possibilities aircraft offered for speeding up communications. He considered that there were four parties directly concerned in the question, namely, the Air Ministry, the General Post Office, Imperial Airways, Ltd., as carriers, and the business community represented by the London Chamber of Commerce, and that the co-operation of all four would be necessary if the desired object was to be achieved.

Regularity was essential in mail services, and in that respect night air mail services in particular offered difficulties, and in the early stage disappointment with regard to the gain in time expected by the senders would be inevitable.

The question of extending the England-India service to Australia had been discussed with the Australian Delegates to the Imperial Conference. Proposals had been formulated and were now being considered not only by Australia but by the Governments of India and the Straits Settlements. The inauguration of the scheme would depend largely on the financial support available, but he hoped that a service beyond India would be the next development in Empire air services.

As regards the matter of air mail postal charges, there was no doubt that the suggestion for the introduction of a $\frac{1}{4}$ -oz.

unit of weight presented certain difficulties, but in view of the representations made by the deputation, it might be worth while to see if they could not be overcome by co-operation between the four parties concerned.

Lord Herbert Scott again thanked Lord Amulree for receiving the deputation, and said that they were very glad indeed to know that he was so much in sympathy with the views put forward.

THE FRENCH AIR LINE TO SOUTH AMERICA

ACCORDING to the Paris correspondent of the *Times*, the proposals of the French Government for the reorganisation of the *Compagnie Générale Aéropostale*, which works the air mail line from France to South America, was rejected by the Air Committee of the Chamber of Deputies on March 6 by 17 votes to three.

The statement issued by the Government began with a declaration that the Government considered itself bound "to maintain aerial communication with the North African Empire and the principal States of South America." The first article of the proposed scheme authorised the Government to make with the *Compagnie Générale Aéropostale* a contract involving a State subsidy of a maximum of 80,000,000 fr. (£640,000) a year until August 1, 1944, at the outside.

The second article provided that the Government should hold at least 25 per cent. of the share capital of the company, and should guarantee the authorised share issue of the company up to £800,000. The third and fourth articles provided for Government representation on the board of directors, and abolished the payments to the Government hitherto made by the company.

After hearing the objections of the Committee to this scheme, M. Dumesnil, Minister for Air, decided to place an alternative scheme before the Committee.

A Night-Flying Experiment

AN Air Ministry Notice to Airmen states that a three-engined Fokker F.VII aircraft, operated by S.A.B.E.N.A. on the London-Brussels night air service, has been fitted for experimental purposes with flashing side lights. Accordingly, the red and green lights of this aircraft will each exhibit 60 flashes per minute. The time-table of the service referred to, which does not operate on Saturday and Sunday nights, is as follows:—Brussels, dep., 23.30; Croydon, arr., 02.00. Croydon, dep., 02.30; Brussels, arr., 05.00.

Night Flying on German Air Routes

PLANS are in hand by the German Ministry of Traffic for the ground lighting of further air routes for night flying. The lighting on the Berlin-Halle-Leipzig-Nuremberg route

In a *communiqué* issued on March 6 the *Aéropostale* Company lays emphasis on the importance and value of its services, which extend over some 35,000 miles of routes, using 200 machines, eight steamers, 46 aerodromes, and 70 wireless stations. Its services carried 32,000,000 letters in 1930, were used by 25 nations, and received 98 per cent. of the postal fees for French air mail services.

On March 7 the Air Committee of the Chamber heard a statement by M. Dumesnil on the proposed reorganisation of the air line to South America. M. Dumesnil said it would be very difficult to make any arrangement by which the *Compagnie Générale Aéropostale* would receive merely temporary assistance, as the opponents of the Government plan desired.

Inquiry had shown that the company needed funds for the repayment of £400,000 advanced by a Brazilian bank. It had also to find £136,000 for interest on its shares and £48,000 for various payments, and the Bank of France had advanced it £320,000. If the obligations of the company in Brazil were not met its creditors in the country would be able to seize its property and equipment there, and the line would have to stop short at Natal. M. Dumesnil therefore proposed to enter into negotiations with the Brazilian creditors, and said he hoped to be able to present a new plan to the Committee by the end of this month.

will be continued to Munich, the starting point for the international lines to Vienna, Milan, Zurich, Geneva, and Barcelona. The ground lighting on the Berlin-Hanover-Cologne route will be carried on to the German border.

Sir Van Ryneveld's New Post

COL. SIR A. VAN RYNEVELD, it is reported, has resigned his position as Director of the South African Air Force to take up work with Imperial Airways.

Imperial Airways Dividend

IN our list of aircraft companies' stocks and shares, published in *FLIGHT* for February 27, the last annual dividend of Imperial Airways, Ltd., was given as 7½ per cent. Imperial Airways, Ltd., inform us that this is not correct, and should be 5 per cent.

INTERNATIONAL AERONAUTICAL CONFERENCE

M. R. F. MONTAGUE, M.P., Under-Secretary of State for Air, welcomed the members of the Thirty-second International Aeronautical Conference, which is meeting in London, at a plenary session at the Foreign Office on March 5. Mr. Montague said:—"I am extremely happy to have the honour on behalf of His Majesty's Government of welcoming to London the representatives of the air administrations of the States associated attending the Thirty-second International Aeronautical Conference.

"You are discussing many important questions of a practical administrative character concerning the operation of air services, ground organisation, and other ancillary services. I notice that one of the questions is that of the further extension of the conferences to include other States, and I feel that this is a matter of very great importance in view of the international character of civil aviation. It is because the air has no physical boundaries that co-operation between nations of the world is not only important in itself, but is a practical harbinger of understanding and friendship transcending the limitations even of aviation itself.

"One of the important works that you have achieved in the past has been the settlement of the regulations of the conduct of the aeronautical wireless service, and the principles laid down in these regulations are, I observe, about to be adopted by the International Commission for Air Navigation with a view to more general application. There are also, I notice, included in your agenda for the present meeting, a number of questions which are important from considerations of safety, such as the lighting of aircraft, measures to be taken for the assistance of aircraft forced to alight on the sea, and the night lighting of air routes. Meteorology is also a subject to be considered in a number of practical directions.

"I also note that on this occasion a special committee of

Customs experts has assembled for the purpose of considering questions of mutual interest to the customs and air administrations. I am happy to note that their efforts are directed to devising means of facilitating air traffic and enabling the full benefit to be derived from this new and rapid form of international transport.

"I am, personally, very interested in the question of air safety, as I feel that public confidence and the development of that psychological condition we have come to call 'air-mindedness' depend so much upon convincing the 'man in the street'—to use an English idiom—that flying is not only an exhilarating, efficient and time-saving experience, but far from being a dangerous adventure. Britain is anxious to co-operate with the rest of the world in everything that can be done to popularise aviation, and the Government for which I speak is convinced that progress, both material and moral, in goodwill and economic security depends upon what the nations of the world can do together. Conferences such as the one which you have come to our capital to attend represent—amongst the many post-war developments in the cause of world-wide understanding—something of great importance and value.

"The last time you met in London your deliberations were presided over by the late Air Vice-Marshal Sir Sefton Brancker. You are aware of the great interest he took in aeronautical questions from an international point of view and the fine services he rendered to world co-operation in air matters, and I am sure that you all, who knew him so well, share with us a sense of irreparable loss. He died in the service of aviation, and his memory will long be revered by people of all nations who came in contact with him in his work and appreciated the magic of his personality.

"May I conclude by wishing you every success in your deliberations."

AIR ESTIMATES

THE Air Estimates for the year 1931* were issued on March 9 and show a net increase of £250,000, as compared with last year's estimates. The gross estimate is £21,197,200, but appropriations in aid are expected to amount to £3,097,200, thus reducing the total for effective and non-effective services to £18,100,000.

The following table shows the net amounts required under the various votes, and we have added the figures for the last five years.

Vote	NET ESTIMATES.					
	1931	1930	1929	1928	1927-28	1926-27
1 Pay, etc., of the Air Force	3,907,000	3,731,000	3,323,000	3,401,000	3,160,000	3,405,000
2 Quartering, stores (except technical supplies and transport)	1,721,000	1,735,000	1,676,000	1,711,000	1,365,000	1,507,000
3 Technical and warlike stores (including experimental and research services)	7,672,000	7,596,000	6,585,000	6,567,000	6,424,000	6,091,000
4 Works, buildings and lands	1,790,000	1,720,000	1,700,000	1,700,000	1,900,000	2,347,000
5 Medical services	302,000	298,000	306,000	310,000	203,000	209,000
6 Educational services	484,000	493,000	498,000	504,000	507,000	432,000
7 Auxiliary and Reserve Forces	599,000	591,000	556,000	554,000	500,000	406,000
8 Civil Aviation	470,000	500,000	450,000	415,000	464,000	462,000
9 Meteorological and miscellaneous effective services	245,000	245,000	228,000	223,000	150,000	135,000
10 Air Ministry	656,000	675,000	661,000	657,000	687,000	761,000
Total effective services	17,846,000	17,584,000	15,983,000	16,042,000	15,369,000	15,755,000
11 Non-effective services (half-pay, pensions and other non-effective services)	254,000	266,000	217,000	208,000	190,000	245,000
Total effective and non-effective services	18,100,000	17,850,000	16,200,000	16,250,000	15,550,000	16,000,000

Personnel

The numbers of personnel to be borne on the establishment of the R.A.F., or attached thereto, exclusive of India, but including Aden:—*Air Officers*: Total, 38 (same as last year). *Other Commissioned Officers*: 3,200 (a decrease of 100). *Cadets*: 130 (an increase of 3). *Warrant Officers*: 500 (an increase of 40). *Non-commissioned Officers*: 5,500 (an increase of 200). *Aircraftmen*: 19,432 (an increase of 57). *Apprentices*: 3,200 (a decrease of 200). Number to be voted: 32,000 (including Army personnel attached to R.A.F.) (same total as last year).

Financial Expenditure

Vote 1, Estimate of the sum required for pay, etc., of the R.A.F.:—Pay and personal allowances of officers, £1,241,000; pay and personal allowances of airmen, £2,242,000; marriage allowance, £121,000; miscellaneous allowances and payments, £32,000; civilians, £907,000; service gratuities to airmen on discharge, etc., £20,000; recruiting staff and expenses, £9,000. Gross total, £4,572,000. Appropriations in aid, £665,000. Net total, £3,907,000. Net increase, £176,000.

Vote 2, Accommodation allowances, £175,000; barrack services, £62,000; fuel and light, £233,000; general stores, £128,000; clothing, £272,000; provisions and horses, £589,000; transport, £389,000. Gross total, £1,848,000. Appropriations in aid, £127,000. Net total, £1,721,000. Net decrease, £14,000.

Vote 3, *Technical and warlike stores* provide for the following amounts:—Aeroplanes, seaplanes, engines and spares, £6,529,000; experimental and research establishments, £183,000; inspection services, £179,000; aircraft technical and warlike stores, £164,000; armament and ammunition, £524,000; electrical stores, £296,000; miscellaneous research and development, £270,000; miscellaneous materials, £205,000; balloons and hangars, £16,000; mechanical and other transport, £280,000; petrol and oil, £727,000; rewards to inventors and miscellaneous claims, including war liabilities, £30,000; airship development, £59,000. Gross total, £9,462,000. Appropriations in aid, £1,750,000. Net total, £7,672,000. Net increase, £76,000.

Vote 4, *Works, buildings and lands*, shows the following figures: Staff for works services, £232,000; new works, additions and alterations amounting to £2,500 each and upwards, £1,091,500; new works, additions and alterations under £2,500 each, £137,000; ordinary repairs, renewals and maintenance, £495,000; grants towards the cost of works, £40,000; purchase of lands and buildings, £50,000; rents, compensations and reinstatements, £27,000; incidental expenses of Air Ministry estates, £11,000; provision of telephone and telegraph services, £500; miscellaneous works services, £10,000; stores and plant for works, £22,000; machine tools, £30,000. Gross total, £2,146,000. Deduct for probable underspending, £100,000. Appropriations in aid, £256,000. Net total, £1,790,000. Net increase, £70,000.

Vote 5, *Medical Services*.—Pay and allowances of officers, £140,000; pay and personal allowances of airmen, £91,000; nursing service, £22,500; fees, etc., to civilian medical practitioners, £7,000; civilians employed in hospitals and

sick quarters, £18,500; medical stores and supplies, £15,000; payments to hospitals, £25,000; miscellaneous charges, £2,000. Gross total, £321,000. Appropriations in aid, £19,000. Net total, £302,000. Net increase, £4,000.

Vote 6, *Educational Services*.—Imperial Defence College, pay and allowances and contribution towards general expenditure, £5,300; R.A.F. Staff College, Andover, salaries, wages and contingencies, £14,000; R.A.F. College and Electrical and Wireless School, Cranwell, salaries, wages and contin-

gencies, £132,000; School of Technical Training (Apprentices), Halton, salaries, wages and contingencies, £248,000; School of Technical Training (Men), Manston, salaries, wages and contingencies, £28,400; School of Physical Training, Uxbridge, salaries and wages, £3,200; School of Store Accounting and Store-keeping, Kidbrooke, salaries and wages, £3,200; general and vocational training, £54,400; miscellaneous educational services, £6,500. Gross total, £495,000. Appropriations in aid, £11,000. Net total, £484,000. Net decrease, £9,000.

Vote 7, *Auxiliary and Reserve Forces*.—R.A.F. Reserve: (a) Pay and personal allowances of permanent staff, £3,700; (b) pay and personal allowances during training, £17,000; (c) retaining fees and reserve pay, £191,000; (d) payment to civil companies for training courses, £195,000; (e) miscellaneous expenses, £2,700. Special Reserve and Auxiliary Air Force: Pay and allowances of H.Q. staff, £11,500. Special Reserve: (g) Pay and personal allowances of regular personnel, £81,000; (h) training, £4,300; (j) miscellaneous expenses, £1,300. Auxiliary Air Force: (k) Pay and personal allowances of regular staff, £54,500; (l) grants to county associations, £21,000; (m) training, £8,000; (n) miscellaneous expenses, £3,000. University Air Squadrons: (o) Pay and personal allowances of instructors, etc., £4,000; (p) miscellaneous expenses, £900; voluntary aid detachments, £300. Gross total, £599,200. Appropriations in aid, £200. Net total, £599,000. Net increase, £8,000.

Vote 8, *Civil Aviation*.—Civil aviation aerodromes, £32,000; air routes, surveys, etc., £31,000; technical equipment, £22,000; works, buildings and lands, £24,000; miscellaneous, £2,000; civil aviation subsidies, £540,000. Gross total, £651,000. Appropriations in aid, £181,000. Net total, £470,000; Net decrease, £30,000.

Vote 9, *Meteorological Services and Miscellaneous Effective Services*.—Meteorological services: (a) Salaries and allowances of the Meteorological Office, £51,500; (b) salaries, wages and allowances of staff at meteorological stations, £61,500; (c) fuel, light and transport, £5,000; (d) instruments, equipment, stores and research, £13,000; (e) works services, £8,000; (f) telegraphic, telephonic and miscellaneous charges, £19,000; (g) superannuation, £2,000. Miscellaneous effective services: (j) Compensation for losses, etc., £12,000; (k) losses by exchange, etc., £300; (l) payments to the War Office in respect of prison services, £1,500; (m) telegraphic and telephonic charges, postage abroad, £62,200; (n) miscellaneous, £23,000; (nn) payment to the Admiralty for services in connection with the Schneider Trophy contest, £3,000; (o) allowances to ministers of religion, £8,000. Gross total, £270,000. Appropriations in aid, £25,000. Net total, £245,000 (same as last year).

Vote 10, *Air Ministry*.—Salaries of the Air Council and Department of the Secretary, £310,000; salaries of the Department of the Chief of the Air Staff, £112,000; salaries of the Department of the Air Member for Personnel, £47,800; salaries of the Department of the Air Member for Supply and Research, £144,000; salaries of the Directorate of Civil Aviation and the Accidents Branch, £20,300; pay of messengers, porters, etc., £24,000; contingent expenses, £900. Gross total, £659,000. Appropriations in aid, £3,000. Net total, £656,000. Net decrease, £19,000.

Vote 11, *Half-pay Pensions and other Non-effective Services*.—Rewards to officers, warrant officers, non-commissioned officers and aircraftmen, £350; half-pay of officers, £9,000; service and disability—retired pay and gratuities of officers and nurses, £147,000; wound pensions—officers, £550; service and disability pensions and gratuities—warrant officers, non-commissioned officers and aircraftmen, £55,000; pensions gratuities and allowances to widows, children, etc., £23,500; civil non-effective payments, recurrent charges, £9,300; civil non-effective payments—gratuities and other non-recurrent charges, £4,700; injury grants, £5,650; commutation of retired pay, wound pensions, etc., £18,400; relief fund, £500; compassionate grants, £50. Gross total, £274,000. Appropriations in aid, £20,000. Net total, £254,000. Net decrease, £12,000.

MEMORANDUM BY THE SECRETARY OF STATE FOR AIR TO ACCOMPANY AIR ESTIMATES FOR 1931

Financial Summary

AIR Estimates for 1931 show a net total of £18,100,000, being an increase of £250,000 on the current year's figure of £17,850,000. The gross total is up by £273,400 at £21,197,200 as compared with £20,923,800 in 1930.

There is thus again a slightly larger rise in the gross than in the net figure, which is due to an increase of £23,400 in appropriations-in-aid. These latter, however, include provision of the necessary funds for the British entry in the forthcoming contest for the Schneider Trophy, without which they would show a decline. Subject to this special factor on the present occasion and the inclusion in these Estimates of the largely increased sum of £155,000 payable by the Dominion and Colonial Governments concerned as a contribution towards the cost of forthcoming African service, the gross figures are the truer index of comparative air expenditure from year to year. It is, therefore, highly satisfactory that, despite the increase in the strength of the Royal Air Force since 1925, the gross total for 1931 remains substantially lower than the corresponding figure for six years ago. The achievement of this result has, of course, been assisted by the smaller sum taken for airships, the further fall in prices during the past twelve months and the estimated reduction in rates of remuneration related to the cost of living, which factors, however, have been partially offset by the need for an extra day's provision owing to 1932 being a Leap Year. But in the main it has only been possible as a result of the exercise of the most rigid economy, the continuous review of establishments both at home and abroad, and the pruning of all services to the limit compatible with efficiency.

There is a "super-cut" of £100,000 (or twice last year's figure) on Vote 4 (Works, Buildings and Lands) but none on Vote 3 (Technical Equipment). Increases of £334,000 on Votes 1, 3, 4, 5 and 7 are partially set off by decreases totalling £84,000 on Votes 2, 6, 8, 10 and 11, making the net increase of £250,000 above-mentioned. The causes of the major variations on the several Votes are explained below and the following table summarises the comparative figures:—

	1931.	1930.	+ or —
	£	£	£
True gross (total of expenditure subheads) ..	21,297,200	21,073,800	+ 223,400
Deduct super-cuts ..	100,000	150,000	— 50,000
Gross estimate ..	21,197,200	20,923,800	+ 273,400
Deduct Fleet Air Arm grant ..	1,126,000	1,267,000	— 141,000
Deduct other Appropriations-in-Aid ..	1,971,200	1,806,800	+ 164,400
Net Estimate ..	18,100,000	17,850,000	+ 250,000

Policy

There has been no alteration during the current year in the main features of air policy. His Majesty's Government, having regard to the fact that Great Britain still ranks fifth of the world's air powers in terms of first-line strength and to the marked growth in recent years of air expenditure abroad, have approved a further modest instalment of the Home

* The "super-cut" is an overhead deduction to discount possible under-spending due (e.g.) to delays in the completion of works contracts or similar causes.

Defence Scheme, which will proceed in the coming year in accordance with programme. It is their earnest hope that the forthcoming Disarmament Conference will bring about a general reduction in air armaments (the rapid development of which the world over they view with profound disquiet) and remove the present serious disparity between the Royal Air Force and foreign air services.

Strength and Distribution of the Royal Air Force

During the year ending March 31, 1931, one squadron of flying boats and two new flights of the Fleet Air Arm will have been added to the strength of the regular Air Force, and in addition, one new cadre squadron is being formed. These developments are as forecast when Air Estimates for 1930 were presented, and on their completion the strength of the Air Force will amount to 72 regular squadrons, including the equivalent of 13 squadrons in the Fleet Air Arm. There will be, in addition, 13 non-regular squadrons, of which 8 belong to the Auxiliary Air Force and 5 are organised on a cadre basis.

In 1931, three new regular squadrons will be added to the Home Defence Force, which will bring the number of such squadrons up to 29 out of the total of 39 comprised in the programme formulated in 1923. The strength of the Fleet Air Arm will be increased by one flight.

Air Routes and Long-Distance Flights

The annual flight from Cairo to the Cape is, this year, being carried out by large twin-engine bombers also capable of use as troop-carriers. The Cape was reached on February 7, the aircraft concerned having up to that time covered a distance of some 5,600 miles. The return flight began on February 11. It is of interest and significance that, following the series of flights by Service aircraft over this route for some years past, a civil air service to the Cape is shortly to be inaugurated by Imperial Airways. The Royal Air Force has here, as in the case of the earlier service between Cairo and Baghdad, played a useful pioneering rôle for civil aviation.

The annual flight from Egypt to West Africa and back was successfully repeated in October and November last with, on this occasion, an extension to Bathurst in Gambia, the total distance covered being 7,200 miles. This, in its turn, may also prove ultimately to be the forerunner of a civil service crossing Africa from east to west. Among other noteworthy service flights during the year may be mentioned one by the Air Officer Commanding in India with three aircraft to Siam and Singapore and back, covering some 6,000 miles; and one by the aircraft of No. 36 Torpedo Bomber Squadron, recently transferred from England to Singapore. Eight machines of this squadron, having been transported as far as India by sea, flew in formation in two sections from Karachi, where they were erected, to Singapore, a distance of 3,400 miles. In the three flights last mentioned a total of 67,100 machine miles was flown with only two forced landings entailing temporary delays to the machines affected of 24 hours and 48 hours respectively.

A successful cruise of 3,830 miles was carried out by No. 201 Flying Boat Squadron in September, in the course of which visits were paid to Norwegian, Swedish, Danish, Polish, Finnish, Estonian, Latvian, and Lithuanian waters. Another long-distance flight of special interest was undertaken by a flying boat from Cattewater (Plymouth), which visited Iceland in connection with the millenary celebrations of that Kingdom. This flight covered some 2,724 miles. Further, a large flying boat successfully carried out non-stop flights from Plymouth to Lisbon and back in August and September, also visiting Gibraltar. The total distance covered was 2,541 miles.

These and other long-distance flights bring the machine miles flown on exercises of this character during the year by landplanes and seaplanes combined up to a total of approximately 115,000, without a single case of injury to personnel or serious damage to aircraft.

The two flying-boat squadrons based respectively on Singapore and Basrah have been actively employed in 1930. It is the policy of the Air Ministry to take every opportunity of testing and extending the potentialities of this most important type or aircraft, of which there are now six squadrons, and of developing new routes for their operation. Thus, three flying boats are at present *en route* by air from England to Basrah for the rearmament of No. 203 Squadron. Their journey of 3,940 miles includes long overland stretches and, with the various other flights above-mentioned, well illustrates the amphibious character of the Royal Air Force and its rapidly growing mobility.

In 1931, flying boats of No. 209 Squadron will for the first time co-operate with the Atlantic Fleet in Mediterranean waters during the Spring cruise.

Operational Activities

The area of dominating interest in the past twelve months has been the North-West Frontier of India, where the air arm played an important rôle in the operations lasting from the month of May to September, which were necessitated by the serious tribal unrest. A force varying from six to eight squadrons was actively employed for the greater part of that period in a constant surveillance of the whole border territory, checking incipient disturbances and restoring order where risings had actually broken out. The political authorities have paid tribute to the very valuable work which they accomplished in circumstances of peculiar difficulty, owing to the wide areas over which the troubles were dispersed. These operations were carried out under most trying climatic conditions and reflect the highest credit on the efficiency and morale of all ranks who participated.

In Iraq less activity has been called for than during the previous twelve months, but the record of the year was not without minor incidents and the squadrons have been constantly engaged on duties of reconnaissance and communication.

In Transjordan, on the other hand, the Air Force has been frequently called upon to assist the civil authority in the difficult task of coping with frontier raids.

Personnel

Vote 1 (Pay, etc., of the Air Force), at a net total of £3,907,000 shows an increase of £176,000 over 1930. This increase is directly due to the growth of the force and would be greater but for the savings achieved by the measures outlined below.

Following on the comprehensive review of the problem of the General Duties Branch completed two years ago, the future requirements for officers of the Stores Branch have been under examination. The principle has again been followed of limiting the number of officers who will look to the service for a life career to the minimum sufficient to provide a highly-trained nucleus. By such limitation money has been found to give to this nucleus substantially improved prospects, which, in turn, should ensure a flow into this branch of officers of ability and also permit of their promotion, in normal circumstances, at ages sufficiently early to allow full scope for the development of initiative and responsibility.

The remaining posts, which are in the junior ranks, will be filled by two other categories of personnel. The first consists of retired officers who will be employed as civilians and will be gradually substituted for serving officers at many stations. The second category will be found by the promotion of a substantial number of warrant officers drawn from all trades. The service will thus gain a body of valuable stores officers, and at the same time a fresh avenue to commissioned rank will be provided for the best of its warrant officers. An important improvement will, therefore, be made in the career which the Royal Air Force offers to airmen, who hitherto have been able to secure commissions only through two channels, viz.: (1) selection whilst aircraft apprentices for cadetships at Cranwell, and (2) appointment of airman pilots to commissions in the General Duties Branch.

This scheme is being brought into operation gradually over a period of years as the older of the present stores officers, whose interests have been carefully safeguarded, retire in the normal course. When fully operative it will result in a substantial saving as compared with the cost of the Stores Branch as at present constituted.

In pursuance of the policy of relieving officers of such of the technical duties of the service as can properly be performed by airmen, the experiment is being tried of appointing warrant officers and senior N.C.O.'s in lieu of flying officers as armament instructors in squadrons. Further developments on the same lines are in contemplation. As a consequence a small saving in officer personnel will be effected and the career open to airmen will be still further improved.

Training and Education

As a result of reorganisation and economies effected in the use of officer personnel, it has been found possible to close down the flying training school at Netheravon, a station which it is now desired to allocate to Home Defence, without providing a fresh school elsewhere in place of it. Apart from the training given at the Royal Air Force College, present requirements can now be met by the three remaining flying training schools in this country and by the school in Egypt.

Pilots are now being trained in "instrument" or "blind" flying, i.e., in flying by the aid of instruments alone. This training is still in an experimental stage, but should prove of considerable value in teaching pilots to fly in and to navigate through clouds.

There has been no change in the general policy of technical training and education. A satisfactory feature has been the steady increase over the past four years in the number of boys of good secondary education applying for entry to Halton as aircraft apprentices, due to the ready co-operation of Local Education Authorities and headmasters combined with a growing realisation of the advantages which the service can offer. Vote 6 (Educational Services) at a net figure of £484,000 shows a small decrease of £9,000, due mainly to minor reductions and adjustments at certain establishments.

Reserve and Auxiliary Forces

Vote 7 shows little variation from the 1930 estimates. The net total of the Vote is £599,000, an increase of £8,000 over last year's figure. Extra expenditure is anticipated under several subheads, chiefly on account of increased provision for the more recently formed cadre and auxiliary squadrons, and for extra flying on the part of pilots of the Royal Air Force Reserve, but this is being met for the most part by compensating savings.

The strength of the cadre and auxiliary squadrons has again, generally speaking, been well maintained. The amount of flying done by these non-regular units grows year by year and the high standard of general efficiency achieved, which was conspicuously evidenced during the annual air exercises, is a tribute to the quality of the personnel of all ranks.

The University Air Squadrons at Oxford and Cambridge, besides continuing to discharge effectively the other functions for which they were created, have served to maintain a satisfactory flow of candidates for commissions in both the regular and non-regular forces. The increased flying carried out by the members of these squadrons has been a noteworthy feature of the year's work.

Technical Equipment

There is this year no "super-cut" on Vote 3 (Technical and Warlike Equipment) the net total of which, at £7,672,000, shows a relatively small increase of £76,000. Provision is made for the rearmament with aircraft of new design of 12 squadrons, and under the 1931 programme the last of the so-called "war-time" types will finally disappear.

Slotted wings (either operating automatically or under the pilot's control) are now fitted to 15 types throughout the Service, the fitting of four more types is on the point of completion, and the principle is being still further extended. In sum, 80 per cent. of aircraft are now equipped or will shortly be equipped with slotted wings.

Parachutes are now available for every officer and man in the air, and on completion of the 1931 programme provision will have been made for their carriage in all types of aircraft in service. The new quick release gear for use over water has proved satisfactory, and deliveries of parachutes fitted with this gear have begun.

The scheme of replacement of motor transport is being continued. Light and medium weight vehicles have now been brought up to date and progress is being made with the introduction of new vehicles of the heavier types.

The provision for petrol is higher, due, as in the past, partly to the increased volume of flying, but mainly to the larger horse-power of modern engines. As an illustration of this latter factor, it may be mentioned that the latest single-seater fighter is equipped with an engine of nearly two and a-half times the horse-power of the similar type of 1918.

Research and Technical Development

The reorganisation of the Royal Aircraft Establishment at Farnborough will continue during the year. Provision is made in these Estimates for the cost of the new wind tunnel and the seaplane testing tank to be installed at this establishment. The 24-ft. wind tunnel, which will be large enough to enable full-scale experiments to be made on the airscrews, engines, and fuselages of aircraft, has now been tested in model form, and its construction will be put in hand shortly. The seaplane tank is nearly complete and will be available for use during the year.

The compressed air tunnel (in which the variable density of the air increases the accuracy of data obtained from scale models) will be ready in the course of a few weeks. This tunnel is being erected at the National Physical Laboratory at Teddington.

Two new monoplanes of the "parasol" type have been designed and constructed for research purposes. These are so arranged that the incidence of the forces acting upon their wings can be accurately measured in actual flight; and their construction also allows of wings of different sections being fitted as necessary for investigation and experiment.

A new attack has been made upon the problem of fire in aircraft by the development of a flame trap to be incorporated in the induction system of the engine; this device, while not interfering with the flow of gas to the cylinders, eliminates the flame of a "back-fire." Considerable progress has also been made recently in the fire-proofing of the fabric parts of aircraft.

The silencing problem is being closely studied. Accurate measurements of noises have been made with "audio-meters" in air liners of Imperial Airways and of foreign operating companies, and comparative data have been obtained between geared and ungeared engines. The lower speed of the airscrew with the former type has been proved to be beneficial and further experiments are being made with engine silencers and with soundproof materials for the construction of cabins.

Airships

£50,000 only has been provided for airships in these Estimates, which sum is taken on account to enable the Royal Airship Works to be maintained for a short period pending a decision by His Majesty's Government on the future policy of airship development. Until this decision has been taken, it is not possible to estimate the financial provision which will be required for the whole year. In the meantime a reduced staff is being maintained at Cardington, where the normal work is being supplemented by special items diverted thither as an emergency measure, *e.g.*, the reconditioning of lorries, the manufacture of drogue targets and tests of experimental kite-balloons.

Works

Vote 4, at £1,790,000 net, shows an increase of £70,000 on the corresponding figure for 1930.

The provision for major new works shows an increase of £193,500. Works already in progress account for £126,500 of this increase; the balance is due mainly to the anticipated requirements of flying-boat units at Pembroke Dock, Hong Kong and Basrah.

The negotiations for an Anglo-Egyptian treaty having been suspended, it has been necessary to allow for the continued occupation for the time being by the Royal Air Force of Heliopolis and other stations outside the Canal Zone. Provision for various urgently-required improvements in living accommodation has, therefore, been included in these Estimates. Money has also been taken for further works services necessary for Army troops in Palestine, but the cost of these and of other new works in Iraq, Palestine, and Transjordan will be covered by an appropriation-in-aid from the Colonial and Middle Eastern Services Vote.

The "super-cut" made in accordance with the practice of previous years to discount unforeseen delays is £100,000.

Civil Aviation

The gross total of Vote 8 (Civil Aviation) at £651,000 shows an increase of £104,000, reflecting the contributions of the Union Government and other African administrations to the forthcoming air service to the Cape. The net estimate, however, at £470,000 is lower than in the current year, though materially higher than actual expenditure in 1929. This decline should be only temporary and is due to the postponement, owing to the difficult economic and financial conditions obtaining in the countries concerned, of certain major projects, more particularly the Australian service. His Majesty's Government in the United Kingdom attach great importance to the extension of the existing Indian service to Australia, and are ready to contribute to its cost. Modified proposals for the organisation of a mail service in the first instance have been communicated to His Majesty's Government in the Commonwealth of Australia and other interested administrations. When this and other important Imperial schemes can be brought to fruition, Vote 8 will necessarily show a substantial increase.

Aviation Weather Reports

So important is the circulation of authoritative and frequent reports on weather conditions to the efficient conduct of aviation services that flying authorities in all parts of the world are planning to equip civil aerodromes with wireless transmitters, which will enable them to exchange information on this subject. One of the latest aerodromes to be equipped with a specially economical type of apparatus mainly for meteorological services is the Dubendorf aerodrome in the Canton of Zurich, Switzerland, for which a Marconi short wave set Type S.100b has been ordered. The station at Dubendorf will operate in conjunction with the long-wave transmitter at Zurich aerodrome for the transmission of meteorological reports to other aerodromes and to aircraft in

£520,000 (of which £155,000 will, as already mentioned, be recovered from the other Governments participating) has been included for payment to Imperial Airways Ltd., in respect of their European, Indian and African services. The first flight on this last-mentioned service, as far as Mwanza (Tanganyika), is due to leave Cairo on March 5, connecting with the service which left London on February 28, and the through route to Cape Town should be in operation by midsummer.

The provision for payments to light aeroplane clubs and National Flying Services, Ltd., is £20,000.

Sums have been included for experiments with a wireless directional beacon designed to assist the navigation of aircraft in conditions of bad visibility, and for the installation of a Neon ground lighting system at Croydon Air Port to facilitate landing in such conditions.

It is proposed to continue during the year the work of improving the surface of Croydon Aerodrome.

Meteorology

The expenditure on meteorology under Vote 9 shows an increase of £2,000 on that for the previous year.

Provision has been made for certain minor increases of staff at Headquarters. These are necessitated partly as a result of the growing use of wireless telegraphy at sea by merchant ships, and partly by certain special requirements—in particular, a scheme of the Ministry of Agriculture for the co-ordination of crop yields with weather, and courses of instruction for officers of the Royal Navy, towards the cost of which Navy Votes will contribute.

Increasing demands are being made upon the Meteorological Office by the development of Civil Aviation and by the growing requirements of the Royal Air Force as a result of the opening up of new stations and the extension of stations already existing.

In accordance with the policy of placing upon the Meteorological Office responsibility for meeting the meteorological requirements of the Royal Air Force, civilian meteorologists are now operating in all commands except Iraq. A beginning will be made during 1931 with the replacement of service by civilian personnel in this command also, and a lump sum provision of £1,000 has been included for this purpose.

It has been found necessary to transfer to the Rugby Wireless Telegraphy station the issue of the weather messages intended for ships at sea, which, up to the present, have been broadcast from the Air Ministry high-power wireless station at Kidbrooke. In addition, Rugby will broadcast twice daily a meteorological message giving a selection of observations taken in Europe as part of an international scheme for the rapid exchange of meteorological information between all parts of the northern hemisphere. The issue of these messages from Rugby will involve annual payments to the Post Office of about £5,300. Capital expenditure on wireless equipment by the Air Ministry will, however, be avoided as a result of the Post Office undertaking this work.

Air Ministry

Vote 10 (Air Ministry) shows a decrease of £19,000.

The cost of certain small increases in staff, more particularly in the Joint Directorate of Scientific Research and Technical Development, and also of increments of salary on approved scales, has been more than offset by reductions in the staff of the Directorate of Works and Buildings and the Lands Branch and by the lower provision required for cost of living bonus. The Lands Branch has been absorbed during the year into the Works and Buildings organisation, and it has been found possible in consequence to effect a certain measure of decentralisation.

AMULREE.

Air Ministry,
March 2, 1931.

flight. The Marconi type S.100b equipment is a continuous wave telegraph transmitter with an independent drive system for maintaining the constancy of the emitted wave, operating over a wave range of 30 to 60 metres at a power of 100 watts aerial rating.

The A.A. and Flying Maps

THE Aviation Department of the A.A. is very busy in extending their library of A.A. route maps to cover over 7,500 miles of air routes in Europe. During the past year over 1,000,000 miles were flown by A.A. members, and their flying maps were issued covering a distance of over 400,000 miles. Maps are now being got out for members who wish to tour to Nice, Egypt, Northern Africa and Palestine.

AIRISMS FROM THE FOUR WINDS

A Sensible Long-Distance Flight

PUBLICITY has recently been given to the flight which Capt. Neville Stack and Mr. J. Chaplin propose making to Australia, and we are now permitted to publish a few further details of this matter. Capt. Stack, together with Mr. Chaplin, who, incidentally has made the flight possible, originally hoped to make this flight to Australia on a machine with a cruising speed of 150 m.p.h., which would then have permitted them to go there and back in a maximum of 21 days, and so demonstrate what could be done were the Post Office to institute a mail-carry service with machines having a sensible performance. This schedule has, however, had to be modified since they were not allowed to obtain the machine they had first intended to use, and they will now use a Vickers' Napier (*née* Vivid), which will enable them to keep up a minimum cruising speed of 110 m.p.h., and thereby, with luck, to do the return journey in between three and four weeks. Although they hope to be the first to do the direct return journey, the flight is in no way a stunt and they are not setting up to create records. They have taken every possible precaution to ensure their getting there and back and thereby demonstrate the feasibility of such a journey for mails. The route to be followed will be, therefore, the well worn track which has already been used many times, and could be used for a mail service without a very great deal of reorganisation. The machine is fitted with a ten-hour fuel capacity and a twenty-hour oil capacity, while their "hops" will generally only be of 600 miles, thus allowing an ample fuel margin for having to combat adverse winds. Actually, they have based their calculations throughout on the assumption of having a 25-m.p.h. head wind for the whole journey.

Their intention is to start early in April, but the actual date will be dependent on the weather. The engine is a Napier Lion XIA and extra large Palmer tyres have been fitted on the wheels.

The instruments include two Husun Mk. IIIA compasses; a transmitting type of oil-pressure gauge, whereby the oil is retained in the engine behind a diaphragm, and the pressure is transmitted to the dashboard dial by the diaphragm

through the medium of a special fluid in a flexible metallic tube, thus obviating loss of engine oil should the tube break, which it is, incidentally, less likely to do than with the conventional direct-reading type and a copper tube; a cross level with a self-adjusting bubble so arranged that very great heat can be applied without breaking the glass tube and a "time of flight" clock; all of which are supplied by Smith's Aircraft Instruments, Ltd.

King's Cup Race

THE new route for the King's Cup Race, which is being held on July 25, has now been published, and both the start and finish will be at Heston. The actual route will be as follows: Heston, start; Leicester, turning point; Norwich, control; Nottingham, turning point; Brough, turning point; Leeds, control; Birmingham, turning point; Woodford, turning point; Hooton, control; Heston, control; Shoreham, turning point; Hamble, turning point; Bristol, control; Heston, finish. It will be recollected that the race is being confined to amateurs, and though we cannot see how the status of either professional or amateur can really definitely be defined, we hope that the anticipations of many people that the race will be a farce will not be the case.

The Schneider Trophy and Portsmouth

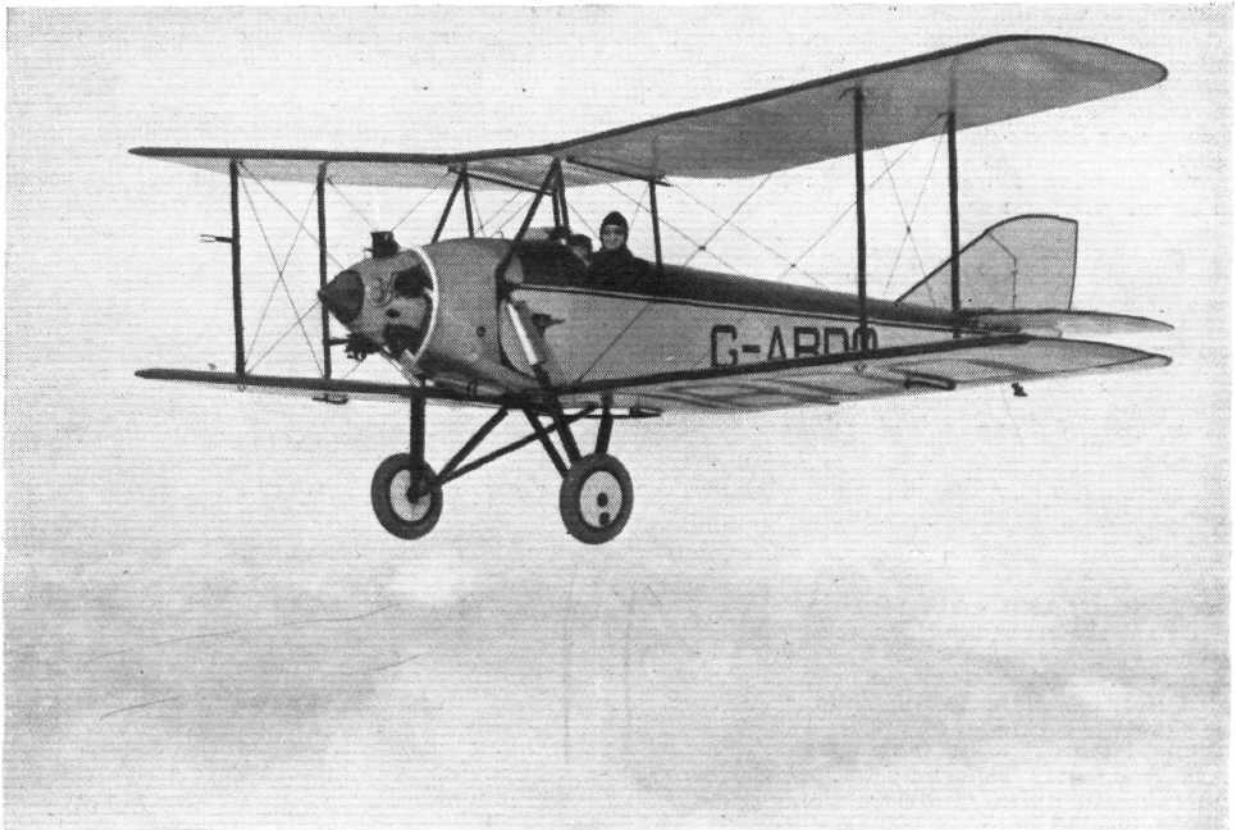
ON condition that the Royal Aero Club made Portsmouth the centre of their activities as regards the Schneider Trophy, the Portsmouth City Council has agreed to grant £2,000 towards the expenses of the contest.

Fritz von Opel Buys a Puss Moth

HERR FRITZ VON OPEL, inventor and designer of the rocket-propelled car, with which he has conducted much experiment in Germany, has placed an order with the De Havilland Aircraft Co., Ltd., for a Puss Moth enclosed high-speed touring aeroplane.

R.A.A.F. Officer Honoured

THE King has been pleased to approve of the award of the Air Force Cross to Flt.-Lieut. Charles Eaton, Royal Australian Air Force, in recognition of his zeal and devotion to duty in conducting flights to Central Australia in search of missing airmen. Lieut. Eaton took a prominent part in the



WINTER CRUISER: The Robinson "Redwing II," which is fitted with Armstrong Siddeley "Genet" Engine, recently made a tour of about 1,000 miles to various towns in England. The machine is here seen at an altitude of 5,000 ft. above the clouds. (FLIGHT Photo.)

search for Anderson and Hitchcock in 1929, and on January 10 last, after nine unsuccessful flights, Eaton finally located two stranded airmen who had been missing in the Central Australian desert since December 20. They had existed for three weeks on a diet of boiled grass and tadpoles.

Mrs. Victor Bruce on Her Flight

ON March 17 the Hon. Mrs. Victor Bruce will give a lecture at the Aeolian Hall, New Bond Street, W.1, at 3 p.m., and again at 8.30 p.m., in which she will tell the story of her remarkable adventures whilst flying through twenty-three continents. The Viscountess of Elibank will preside in the afternoon, and the evening chairman will be Colonel the Master of Sempill. The prices of the tickets for this lecture, which will be fully illustrated with lantern slides and kinematograph films, are 2s. 4d., 3s. 6d., and 5s. 9d.

Air Pageants Galore

BERKSHIRE Aviation Tours, Ltd., of Manchester, are staging a joy-ride drive on very ambitious lines during the forthcoming season. Over 150 air pageants have been arranged at some 52 different towns throughout Great Britain. A large number of pilots have been engaged, and two fleets of aircraft consisting, we believe, of four Avros and two Moths each, will give a complete show, according to a previously-rehearsed programme, at each town. The Berkshire Aviation Tours is, of course, run by Messrs. F. V. Holmes and J. F. Leeming, who formed Northern Air Lines, Limited, to run the air port of Manchester. A new company has recently been formed, called Northern Air Transport, Ltd., to take over the interests of Northern Air Lines, Ltd., and we understand that a large amount of work is being done at Manchester.

Jugo-Slav International Aero Exhibition

AN International Aero Exhibition will be held next month at Zagreb, Yugoslavia, where British light aeroplanes, sold to Yugoslavia during the past six months, will be amongst the exhibits.

"Graf Zeppelin" for Arctic Flight

A PROPOSED flight over the Arctic by the airship *Graf Zeppelin* is once again reported. Dr. Hugo Eckener, who is in New York, is stated to have said he hopes to finance such a trip.

No. 209 Flying-Boat Squadron

It has been decided to cancel the proposed flight of the two Iris flying-boats of No. 209 Squadron from Plymouth to the Mediterranean. For over a week the two flying-boats have been waiting at Mount Batten air station to begin their cruise to Gibraltar, where they were to take part in exercises with the Fleet, but adverse weather reports were received, and finally it was decided to abandon the flight.

The Potters Bar Airship

A GERMAN Day of Remembrance was observed in Potters Bar on March 1 by the laying of wreaths on the graves of the German airmen who lost their lives when a Zeppelin—or to be strictly accurate, a Schutte-Lanz—was brought down near Potters Bar in September, 1916.

Enterprise

SMITH'S AIRCRAFT INSTRUMENTS, of 178-185, Great Portland Street, W.1, have shown their appreciation of the possibilities of doing business in South America, and have just issued a catalogue of their aircraft instruments which is entirely in Spanish. This will be circulated throughout all the South American markets, and should go far to prove that British manu-

facturers are not so backward with their salesmanship methods as many would have us believe.

Flying in Ireland

PILOTS who are considering a visit to the Irish Free State during the coming summer and who have had painful experiences of delays at Baldonnell in the past will be pleased to hear that the Customs officials have altered their routine—a miracle!—and visitors should have every chance of getting away from the aerodrome in under the two hours and longer that was often necessitated under the old system. Another improvement to the aerodrome is the laying of a stone apron from the hangars on to the field: many pilots who have wallowed through the mud in the past will offer up their thanks for this small mercy. Messrs. Phillips and Brailey, of the Cardiff Aero Club, who have been paying a flying visit to Ireland, have been to Killarney and expressed their surprise at the slackness of Irish enterprise in not establishing a service of 'planes to this famous beauty spot for the tourist. The question of a civil aerodrome appears to be shelved, but our correspondent learns that this is not so, and certain members of the Government staffs are worrying themselves grey over the problem.

A Useful Catalogue

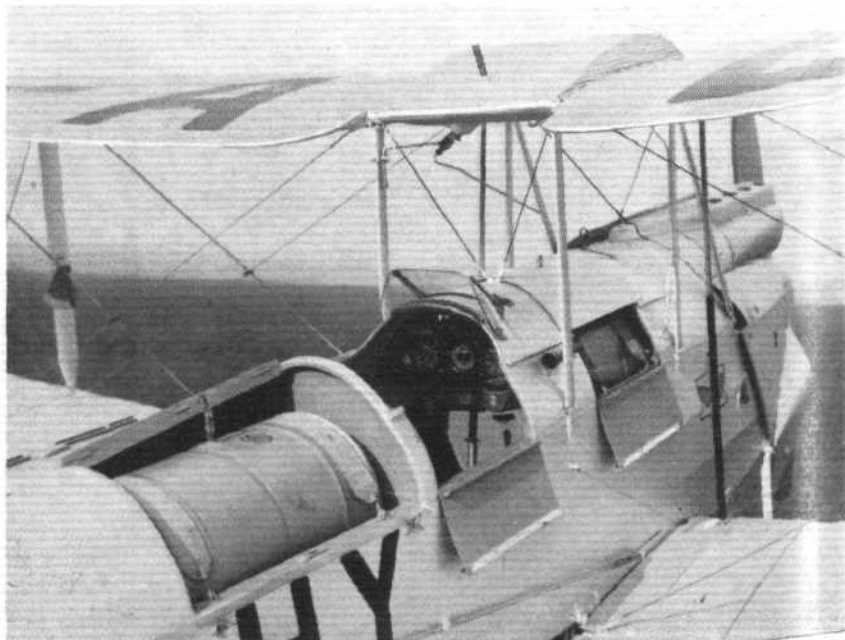
T. C. JONES AND CO., of 95, Wood Lane, Shepherds Bush, W.12, have just issued an exceptionally interesting pocket size catalogue of the tools which they supply. Their range includes every possible form of tool or equipment which public works contractors, municipal authorities, aerodrome managements, and to a large extent aircraft manufacturers, can want. It is well got up with a comprehensive index and, in most cases, prices are quoted. The company will be pleased to send a copy of this catalogue to any reader who is genuinely interested, if they write mentioning *FLIGHT*.

Colours to Order

CELLON, LTD., the well-known makers of aeroplane dope and Cerric lacquers, have not been slow to take advantage of the opportunities their trade offers to make private owners' machines more attractive. They have produced quite a number of really attractive looking machines lately, which are certainly comparable to, or even better than the best motor cars, despite the Air Ministry regulations requiring the presence of large registration letters. One of the latest of these, and certainly one of the best-looking machines we have seen, is the new Sports Avian now being used by the B. P. Company, the christening of which was described in *FLIGHT* for February 20. The use of such colours in aircraft is going to have a very definite sales value, for the new generation of private owners will certainly not be content with unattractive machines, and Cellon, Limited, will be able to supply any colour or scheme which may take the owner's fancy. During a recent visit to their works at Kingston we were glad to notice that their business has increased to such an extent since our last visit there, nearly a year ago, that they have had to open another large mixing shop and a shed where the finished goods are labelled and despatched. There is also a complete barrel washing equipment, and the colour-mixing and grinding plant has been expanded greatly.

FOR AN ENGLAND - AUSTRALIA ATTEMPT: We referred the other week to an attempt shortly to be made by an Australian, Mr. C. W. A. Scott, to beat Kingsford Smith's flight to Australia. Here we show the cockpit of Mr. Scott's special metal Gipsy Moth (not Puss Moth, as previously reported) to be used on this attempt. It shows the petrol tanks, located in the fuselage and top centre section, which altogether provide a capacity of 101 gals. (*FLIGHT*

Photo.)



R.A.F. CAPE FLIGHT

ON March 11, at 1 p.m., the three "Victoria" (twin Napier Lions) troop carriers of No. 216 Bomber Squadron, under the command of Squadron-Leader H. W. G. T. Penderel, M.C., arrived back at their home aerodrome of Heliopolis, near Cairo. March 11 was the date fixed for their return in the schedule of the tour, and it is extremely creditable that they were able to finish the flight up to time, after a delay of a few days at Broken Hill through an accident when taxiing on the ground. That is typical of the Royal Air Force. When it arranges to reach a certain place on a certain day, it usually manages to keep its word. We are glad that the delay was due to an accident on the ground and not to any failure in the air.

The late Air Commodore Samson, in his account of the Cape flight which he led in 1927, using Fairey IIF machines, used a Victoria as a supply machine on some of the northern stages of the flight, and he wrote without much respect of the Victoria as an aeroplane in a hot country. But the Victoria proved its worth when it did the chief part of the work in evacuating the foreigners from Kabul, when it had to cross the N.W. Frontier hills in the depths of winter. This flight to the Cape and back still further increases its reputation. It is, of course, possible that Flight-Lieut. D'Arcy Greig, as he piloted the heavy troop-carrier along, may sometimes have sighed for a S.S., but doubtless the interest of this great flight made up for any slight inconveniences. Certainly the crews of the Victorias would be fortunate in not having to stint themselves of kit for the journey, and an ample supply of kit makes a lot of difference to comfort when crossing Africa from north to south.

There may have been some anxiety when the large machines prepared to take off from some of the aerodromes along the route, which lie several thousand feet above sea level, but,

apart from the one taxiing accident at Broken Hill, no *contretemps* has been reported.

On the outward journey, the flight left Heliopolis on January 12, and arrived at Capetown on February 7, according to schedule. The return flight started, also as arranged, on February 11, and arrived at Victoria West the same day, Kimberley on the 12th, Johannesburg on the 14th, Pietersburg on 17th, Buluwayo on 20th, Salisbury on 23rd, and Broken Hill on 24th. Here one machine taxied into a hidden tree stump, which is not a desirable feature on any aerodrome, and this caused a delay of a few days. On March 2 the flight took off again and reached M'Pika. On March 6 it had reached Entebbe in Uganda, on March 10 it flew from Khartum to Aswan, and on March 11 it started its last stage for Heliopolis, making a landing on the way at Assiut. The approximate distance on the outward journey was 5,563 miles, and on the homeward journey 5,674 miles, making a total of 11,237 miles.

On the outward journey the flight was to practise carrying troops of the King's African Rifles at Entebbe, at Nairobi, and at Tabora. The African soldiers (excellent fighting men they are reported to be) must have been greatly thrilled by this strange experience, and we hope in due course to receive some details of the event.

The *personnel* of the flight was as follows:—Group Captain E. M. Murray, D.S.O., M.C., representing the Air Officer Commanding the Middle East, Squadron Leader Penderel, Flight-Lieut. D. D'A. A. Greig, D.F.C., A.F.C., F./O. J. B. Knapp, Sergeant pilots W. Manning, R. Harding, and J. Harrington, and five aircraftsmen.

The success of this great flight reflects the greatest credit on No. 216 Bomber Squadron, on the Vickers Victorias, and on the Napier Lion engines.

FLOATPLANE SURVEY IN THE SUDAN.

AIR question of great interest nowadays is to discover routes which, though inland, can be better operated by some form of seaplane, either floatplane or flying-boat, than is possible with landplanes. Great parts of Canada are close preserves of the flying boat. But the question has a particularly live interest in the valley of the Nile, inasmuch as Imperial Airways is opening its African airway in the present year. On this route it has been decided to use "Calcutta" flying boats on the stage Khartum—Kisumu. It is, however, desirable that as much information as possible should be collected about the possibilities of seaplane transport in the Southern Sudan, and accordingly, last July, three Fairey IIF floatplanes, belonging to No. 47 (Bomber) Squadron, R.A.F., were sent out on a twelve days' survey with the following objects:—(1) to ascertain what areas are suitable for the operation of floatplanes at that season of the year; (2) to obtain particulars of landing places for floatplanes, and of sites suitable for bases; (3) to obtain experience of the weather conditions in the Southern Sudan during the rains; (4) to give the latest floatplane type Fairey IIF a prolonged test.

In addition to the above, the opportunity was taken of giving some help to officials of the Sudan administration. A district commissioner was flown from Juba to Nimule, and this saved him a week's trek. Dr. Hurst of the Egyptian Irrigation Dept. was taken for a short flight over the area between the Bahr el Jebel and the Bahr el Ghazal, and another district commissioner was taken for a short flight, which saved him several days of trek.

Starting from Khartum, the three machines went to Malakal, which was made the chief base for the survey. From that base expeditions were made to various places. The itinerary was:—

- July 7 Khartum—El Dueim—Kosti—Malakal.
- " 9 Malakal—Fangak—Ajwong—Mongalla—Juba.
- " 11 Juba—Nimule—Juba.
- " 12 Juba—Bor—Yirrol—Shambe—Malakal.
- " 13 Malakal—Yonga—Lake No—Wau.
- " 16 Wau—Meshra el Rek—Wanki—Malakal.
- " 17 Malakal—Nasser—Garjak Nuer country—Nasser—Abwong—Malakal.
- " 18 Two aircraft Malakal—Melut—El Dueim—Khartum.
- " 18 One aircraft Malakal—Lake No—Adok—Lake No—Malakal.
- " 19 One aircraft Malakal—Renk—Jebel—El Dueim—Khartum.

The conclusions arrived at were:—

(a) The latest type floatplane Fairey IIF, proved to be thoroughly satisfactory for the work involved and experience showed that certain minor modifications which had been made in equipment were an improvement.

(b) During the rains, floatplanes can land and take off:—(1) Along the whole length of the main Nile channel (including the Bahr el Jebel) from Khartum to Juba; (2) Between Juba and Nimule only on one or two reaches of smooth water between the rapids and at Nimule itself; (3) On Lake Yirrol; (4) At fairly frequent intervals along the Bahr el Zeraf; (5) At frequent intervals along the Bahr el Ghazal from its mouth to Meshra el Rek; (6) On Lake Ambadi; (7) At frequent intervals on the Jur river as far as Wau, except for a distance of 30—40 miles from its mouth to Lake Ambadi, where it is too narrow and serpentine; (9) Along practically the whole length of the Sobat and Baro rivers from the mouth of the Sobat to the Abyssinian border.

(c) During the rains, flying withing the area Jebel—Wau—Nimule is very much better carried out on floatplanes than on landplanes, particularly as all the landing grounds in this area are out of action at that season.

(d) Even in the dry season, flying in the area Yirrol—Malakal—Ghabat el Arab—Meshra el Rek is better carried out on floatplanes than on landplanes owing to the extent of the sudded swamp country where a landplane could not possibly land.

(e) Malakal is the centre of the Sudan from the floatplane point of view, as all the rivers where floatplanes can operate, branch off just south of Malakal (Jebel, Zeraf, Ghazal, Arab, Jur, and Sobat).

The following places proved suitable for the landing and taking off of floatplanes:—El Dueim, Kosti, Malakal, Ajwong, Mongalla, Juba, Nimule, Bor, Yirrol, Shambe, Lake No, Wau, Meshra el Rek, Ghabat el Arab, Nasser, Abwong, Adok, Renk, Jebel.

Local thunderstorms were met practically every day. There is a distinct tendency for these storms to form very rapidly early in the day, and about 1500 hours to unite into one large storm of considerable intensity. Before that hour the smaller storms can easily be avoided by aircraft. Flights should commence at 0800 or 0900 hours and finish before 1400 hours. Aircraft then have time to turn back in the case of heavy storms developing, and will be at their destinations before the regular daily storms assume formidable dimensions. Very few strong winds were met, except in the vicinity of storms, and those were nearly always from the south or south-south-east. Usually the machines were flying in a flat calm.

CORRESPONDENCE

[The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.]

AVIATION INSURANCE

[2369] CAN it be that insurance companies are demanding premiums higher than are justified by statistics, and thus discouraging the development of civil aviation at a time when its fostering is a matter of premier national importance. Not only do such high premiums tax the resources of pilot and passenger, but also must create, by implication, an unjustifiable feeling that aviation is much more dangerous than other forms of transport.

In the case of my own firm, an aeroplane being kept for business purposes, we do all we can to encourage our staff to travel by air and develop "air sense." They are more than willing to avail themselves of such opportunity, but some are restrained by the fact that it is necessary to take steps to amend their insurance policies and pay additional premiums varying from £2 to £5 per cent. to cover the alleged risk of an occasional trip by air. The policies held by some others cannot even be amended to include flying. As a firm we take out a policy covering passenger risks, but this does not affect the fact that the private individual's policy is nullified.

May I appeal to insurance companies to give a helping hand to aviation by fixing premiums commensurate with the risks really involved. I recall the exaggerated premiums demanded in the early days of motoring.

ALEXANDER DUCKHAM.

Cannon St., London, E.C.4.
February 16, 1931.

OUR AIRSHIP POLICY

[2370] A discussion in FLIGHT between your readers on our airship policy and some articles on the subject would, I think, be welcome.

The position as I see it is this:—America is building two very large rigid airships, has recently tested an all-metal one of possibly revolutionary design, and is planning the construction of a larger ship of the same type.

Germany is making headway with the successor of the magnificent Graf Zeppelin, and at least two other countries, Japan and Soviet Russia are experimenting and building. Great Britain has probably more to gain from the airship than any other nation, and the fate of their development in this country will be decided in a few months by an Air Minister who has no technical knowledge, a short time after the most terrible disaster that has ever befallen aviation. Without doubt, Lord Amulree will give his unbiased opinion on the type of airships of which R 101 and R 100 were the most modern examples, but we cannot expect him to say whether we should continue to build all-metal airships or those of elliptical section.

Commander Burney and Mr. Louis Coatalen have ideas concerning airship design very different to those embodied in R 100 and R 101. And I would say that the construction of a class of aircraft, one single example of which has flown round the world in record time, which holds the world's distance record for all types of aircraft, and has crossed the Atlantic five times, should not be discontinued without the most careful consideration by the greatest aeronautical brains of the nation.

P. D. B.

Haywards Heath,
Sussex.
February 23, 1931.

LANDING AT CROYDON

[2371] Referring to your description of the Autogiro in "Croydon Weekly Notes" in the February 27 issue, I was much amused at this account, and suggest that perhaps the unfortunate pilot had already been bitten, and you know the old saying, "Once bitten, twice shy."

I have only to mention the word "Croydon" to my pilot to cause an expression of agony to pass across his face.

In the summer of '29, seeing a joy-riding 'plane in a field, I suddenly had a desire to see what flying was like, and had a 5s. flip, and wanted more. When asked where I wished to go, I could only think of Croydon.

We arrived and spent about an hour there, for which the pilot was charged 10s. fees. When we wished to start, the pilot spent about a quarter of an hour running about trying to get someone to swing the prop.

Eventually a big, important, portly gentleman was secured, and after much puffing, he got things going. Since then I have been a number of trips amounting to over 1,200 miles, but, needless to say, never again to Croydon. Most likely I shall be again having another flight on an Autogiro, and shall not fail to ask the pilot if he was at Croydon at the time mentioned in your note. Incidentally, I had no difficulty in getting him to land in Bembridge, I.W., flying field.

J. W. COOPER.

Shanklin, I.O.W.

March 4, 1931.

JUNKERS "JUNIOR" CONSTRUCTION

[2372] I have read with great interest the articles on the Paris Show in the AIRCRAFT ENGINEER. However, in the remarks on the Junkers "Junior," I would like to make a few comments. The engine installed was a Siemens, and not a Genet. There also seems to be a mistake about the leading-edge of the wing. This is no seamless tube, but simply a flat, rolled up into a conical shape and riveted with a single row of rivets (double row in earlier models). In the exhibition piece the tube was revolved, so that the seam was not visible at a casual glance. Thus, this member is really very cheap to fabricate. The other point is that the Junkers firm do not insert rivets from one end of a tube in any case. Only the "holding-iron" is inserted in the tubes, while the rivets are inserted from the outside, hammered with air or hand-hammer, the head being formed on the inside by reaction against the holding-iron. The heads on these "Junkers rivets" are very carefully inspected by inserting lighted "telescopes" into the tubes and checking every head. These cylindrical-shaped heads are far easier to inspect than the usual rounded type, as there is no possibility for a workman to try to cover up bad work. This is also the type of riveting used in riveting the skin to the circular frames in the "Junior," this being done from the outside with an air-hammer. With even a little examination this type of riveting is easily recognised, as the round heads on the outside still show the tiny circle which indicates that the material is dural, which could not show if the head was formed on the outside.

I hope that you have no objections to these corrections, which I am just making for the purposes of accuracy.

Fliegerlager Wasserkuppe,
Gersfeld, Rhoen, Germany.
March 5, 1931.

B. S. SHENSTONE.

IN PARLIAMENT

Air Services to the Channel Islands

MR. MONTAGUE, in reply to Mr. Everard, said no recent proposal for establishing an air service between England and the Channel Islands has been received by the Air Ministry.

Post Office and the Indian Air Mail

THE ASSISTANT POSTMASTER-GENERAL (MR. VIANI), in reply to Sir Nairne Stewart Sandeman, said.—The air fees to the public for the Indian Air Service are fixed at the lowest figure which will ensure that the transport and other charges incidental to the service are covered. This result has hitherto been achieved; but the general finance of the Indian Air Service is not, of course, a matter for which my Department is responsible. All possible steps have been taken to bring this service and the advantages it offers to the notice of business houses and all persons likely to be interested.

India Air Mail Service

THE SECRETARY OF STATE FOR INDIA (MR. WEDGWOOD BENN), in reply to Lt.-Com. Kenworthy said the Government of India estimated, in 1929 that the cost of subsidising a weekly air mail service between Karachi and Calcutta via Delhi in both directions, if operated by a commercial company, would amount in the first year to about £100,000, and in subsequent years to about £95,000. The idea is that the Government of India should run the services.

Launching Aircraft by Catapults

MR. ALEXANDER, First Lord of the Admiralty, on March 4, in reply to Sir Nicholas Grattan-Doyle, said five vessels of the British Navy are equipped with catapult devices for launching aircraft. Eleven new catapults are on order or completed. Tests of launching aircraft from various types of catapults have been carried out with satisfactory results.

METEOROLOGY AND AIR NAVIGATION

ON Wednesday, March 4, before the Royal United Service Institution, Lt.-Comm. J. W. Josselyn, R.N., gave a very interesting lecture on meteorology and its bearing on air navigation. He started by pointing out the difference between air pilotage and air navigation and said that he would deal mainly with air navigation. When the aircraft was flying chiefly over the sea, out of sight of land from which one could fix one's position, meteorological conditions he said affected air navigation very greatly. On such long flights as, for example, that made by Col. Lindbergh across the Atlantic, it did not matter very much if the pilot was several miles out on reaching the other side, but in short flights where contact had to be made with the fleet at definite points, accurate navigation was absolutely essential. This accuracy, he said, depended very greatly on the knowledge of meteorological conditions in order to keep an accurate knowledge of the aircraft's track and ground speed. He then outlined methods used to determine the direction and strength of the wind, such as pilot balloons, smoke shells or the drift of the aircraft. The wind, he said, follows very definite laws and does not as the Bible would have it "bloweth where it listeth" and, provided these laws are known, can be forecast with a large degree of accuracy. Comm. Josselyn then dilated at some length on the difficulty of defining visibility and its bearing on the navigation of aircraft. He described how fog is brought about by the precipitation of moisture when the temperature of the air is brought below its dew point and how this precipitation is aggravated in districts where the air contains a large proportion of salt or sulphur particles such as round our coasts and over industrial districts. He quoted a case as an example of the advisability of the meteorological officer working in close conjunction with the navigating officer which happened in H.M.S. *Furious* in the North Sea. In the event in question the meteorological officer noted that the temperature of the sea was practically the same as the dew point of the air and therefore he confidently expected the visibility to decrease. The next morning he found, much to his disgust that this forecast was totally wrong, since during the night a warm current of water had come up for the south and had thereby warmed the air instead of cooling it and causing fog. A further weather condition which, he said, affects air navigation, is the presence of bumps, particularly those of the vertical variety, since they alter, very materially, the course and speed of the aircraft. Several examples of the synoptic weather chart were shown on the screen indicating how the meteorologist can forecast the wind and weather through the shifting of areas of high

and low pressure. Examples of warm and cold fronts were also shown and it was explained how the wind always veered after the passage of a cold front. From this the lecturer emphasized the importance of the intelligent use of a strut thermometer as an aid to air navigation. He said that if the pilot was warned that he would encounter the passage of such a front during his flight his strut thermometer would indicate to him that particular passage and he could then allow for the change of wind. Records were shown of several transoceanic flights, notably those of H.M. airship R.34 and of Col. Lindbergh and one or two others, and the methods by which they checked their drift, as, for example, in the case of R.34, by the white horses on the waves and by dropping Holmes' lights; their ground speed by their shadow on the breaking wave tops; their height by the angle subtended by their shadow, knowing the altitude by the sun, in which case barometrical changes were also deduced. In the case of Col. Lindbergh's flight, he pointed out that although a landing was made within three miles of the intended position, the aircraft was actually 250 miles out in its D.R. position, since although the wind did not shift it had increased in force and Col. Lindbergh arrived 2½ hr. before his scheduled time.

In answer to questions raised during the following discussion, Comm. Josselyn said that the white caps caused by breaking waves did not actually travel along but remained in their original position on the surface of the water except in so far as they were moved by the drift, due to the wind, the actual wave motion being wholly under the surface of the water. With regard to the measurement of the wind, he said they usually used the drift and range method, whereby bearings were taken on a smoke bomb which had been dropped some minutes previously. Rear-Admiral H. P. Douglas, the Hydrographer of the Navy, who was in the chair, said that those present would be interested to know that the Admiralty was by no means neglecting this side of science. He informed them that a committee was already investigating the question of defining visibility. He also announced that a series of meteorology courses had been instituted for officers and said that 15 officers had gone through the course last year and he expected some 30 to do so this year. As a further evidence of the Admiralty's foresight, he said there was a chart, No. 5073, which had been compiled from reports sent in by some 40 of H.M. ships showing the distribution of the upper air currents and temperature over the ocean in order to determine the most suitable routes and heights for aircraft to follow on long journeys.



A Simple and Useful Helmet

BURCH's of 33, Bedford Street, Strand, are the makers of an extremely simple flying helmet, which is admirable for



general use. This is called the Instructor's Helmet, but is equally suitable for anyone else, as its great merit lies in the speed and ease with which it can be taken off, the simple two-ring fastening being very easily manipulated even with cold fingers. We ourselves have used one of this type for a considerable number of months and have nothing but praise for it.

Lloyd's Register Cricket Club 37th Annual Reunion Dinner

LLOYD's Register Cricket Club held their annual dinner at the Mayfair Hotel on Saturday, February 28. Mr. Andrew Scott, President of the Club, was in the Chair, and there were many prominent people in aircraft present, including Sir George Higgins, Chairman of Lloyd's Register, Mr. Handley Page, Lt.-Col. H. Outram, Capt. A. G. Lamplugh.

Lloyd's Register are finding that their Aviation Department is getting a rapidly increasing amount of work, and Mr. L. J. Hill, senior surveyor, reports that the number of

aircraft owners who have their annual surveying done for renewal of C. of A. through his department is a very satisfactory one. The Chairman proposed the toast of "Our Club and Patrons," while Sir George Higgins replied, and in doing so anticipated the day when the aviation side of Lloyd's Register would become more important than the shipping side. Mr. Handley Page also replied giving one of his characteristic forceful speeches. The toast to the Members was proposed by Mr. A. L. Sturge, and to the Chairman by Mr. Scrutton. Interspersed between the toasts were several very good variety turns, whose excellence added greatly to the pleasure that all those present took in the dinner.

D. Napier & Son

THE directors of D. Napier & Son, Ltd., announce that their Annual Report, which will be issued shortly, will show (subject to audit) that the net profits for the year ended September 30, 1930, amounted to £169,905 7s. 7d. They have decided to recommend at the forthcoming annual general meeting that:—A final dividend be paid to the ordinary shareholders on the books of the company on March 23, 1931, of 10 per cent. (less income tax) in respect of the year ended September 30, 1930, making, with the interim dividend, 15 per cent. for the year. They also give notice that the ordinary share transfer books will be closed from March 23 to April 1, 1931, both days inclusive.

Irvin Air Chute Demonstrations

It is pointed out to the Editor that the Irvin Air Chute of Great Britain, Ltd., have not engaged Mr. John Trantum as their parachute demonstrator, as inferred in a paragraph published in our last issue. He has arranged to jump during the coming season for Capt. Barnard's Air Tours, Ltd., and for this purpose he will use Irvin air chutes.

REPORT FOR 1929-30 OF THE DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH

THE Annual Report of the Department of Scientific and Industrial Research has just been published (Cmd. 3789). Copies, price 3s. 6d. net, can be obtained from H.M. Stationery Office.

This publication gives an account of the work of the Department of Scientific and Industrial Research during the year ended July 31, 1930. It is divided into the following main sections:—

Report of the Committee of the Privy Council for Scientific and Industrial Research. Report of the Advisory Council.

Summary of the Work of the Research Organisations of the Department. Research Associations.

The Report of the Advisory Council discusses the following subjects:—Research Associations, Locomotive Experimental Station, Fuel Research, Food Investigation, Building Research, William Froude National Tank, Forest Products Research, Radio Research, Water Pollution Research, Atmospheric Pollution Research, Geophysical Methods of Survey, Fabrics Research, Scientific Grants.

In addition to giving further information on most of the

above subjects, the Summary of Work describes briefly the work carried out during the year at the National Physical Laboratory, the Geological Survey and Museum, and the British Museum Laboratory, and the progress made in investigations dealing with Metallurgy, Electro-Deposition, Illumination, Lubrication and X-Ray Analysis of Crystals, etc. In the last section of the Report the results obtained during the year by 20 research associations are also summarised.

The report is supplemented by detailed appendices giving particulars of Research Boards and Committees of the Department; the addresses of the Research Establishments of the Department; Statistics relating to Maintenance Allowances to Students-in-Training; Senior Research Awards and Grants for the Development of Special Investigations; Summary of Finance; information concerning Research Associations; Developments in the Organisation of Industrial Research in other parts of the Empire; List of Publications by Individuals in receipt of Grants; and a List of the Department's Publications issued, or in the press, during the year.

The report is indexed.

PUBLIC ECONOMY AND THE AIR COUNCIL

THE following letter, emphasising the necessity for public economy during the present financial crisis has, by command of the Air Council, been addressed by the Secretary of the Air Ministry to all Air Force Commands, and has also been issued as an Air Ministry Order for the information and guidance of all ranks. The letter states:—

"I am commanded by the Air Council to call your attention to the paramount necessity for public economy in the present grave financial crisis, and to invite your co-operation in ensuring that effective action is taken to meet that necessity.

"The Council wish to emphasise that the object of this letter is not to underline the importance of that frugality and care in administration which is already recognised by any well-conducted command or station to be a normal requirement in its work. The position is that the country is faced with a financial situation of a gravity without parallel in recent years, and it is incumbent upon all ranks of the Royal Air Force to use their utmost endeavours to assist, so far as in them lies, in relieving that situation.

"Accordingly, the Council desire that all responsible officers, under the instructions and guidance of Air Officers Commanding, shall not only deliberately set themselves to review all services, present or prospective, in order to ensure that no expenditure is incurred which is not urgently necessary, but shall also bend their energies to the discovery of new means for effecting savings, whether in outlay of cash or consumption of stores.

"It is not the purpose of this letter to make particular suggestions. Air Officers Commanding are accordingly requested to initiate the necessary measures in their several commands. All authorised establishments and all items of current expenditure should be surveyed—with due regard, of course, to obligations of contract and good faith—subject only to these overriding factors:—

"(a) The safe flying of aircraft must not be endangered in any way; (b) The national security must not be impaired; (c) There must be no loss of efficiency disproportionate to the savings it is hoped to achieve, for this would be false economy.

"With regard to (c) however, the Council wish it to be clearly understood that, in present circumstances, and with high national issues at stake which must be the governing consideration, it is inevitable that economies should be made which involve some temporary sacrifice in matters in which Commanding Officers and their units should take a natural and proper pride.

"Action should be taken forthwith, as it is desired to effect all possible economies in the money provision for the remainder of this financial year, as well as throughout the financial year 1931.

"I am to invite you to report from time to time on the matter, as may seem expedient, partly for the information of the Council and partly to enable them to utilise your suggestions to the widest advantage. Finally, I am to remind you that economies which may seem inconsiderable in themselves or in particular cases may amount to a large total in the aggregate.

"This letter will be reproduced in a special Air Ministry Order, in order that it may receive the widest possible circulation."

MODELS

THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS (S.M.A.E.)

Revised General Competition Rules.—In view of the approaching season's competitions, intending competitors are asked to kindly make a note of the following rules. A new rule (No. 5) added to the general competition rules and which will apply to all "rise-off ground" competitions reads as follows:—"Individual flights (R.O.G.) of 5 seconds or under not to count as competition flights, but only two such attempts to be allowed."

The fuselage formula rule has been revised and is now:—"All fuselage models entered for competitions or 'record-breaking' must be fitted with a body complying with the following formula:—

Minimum value of maximum cross-sectional area = $\frac{10}{(\text{overall length of body})^2}$

10

The overall length to include nose-piece (or spinner when fitted) and tail fairing."

Affiliated clubs are also asked to please note the following revision to Rule No. 16:—"The entrance fee for non-members at 'open' competitions shall be 2s. 6d. Entrance fee for members of affiliated clubs shall be 1s. in the case of senior members and 6d. in the case of junior members under 21 years."

The National Airplane Model contests in America will be held at Dayton, Ohio, from June 29 onwards. Aero-modellists who wish to send models for these contests should write to Merrill Hamburg, Esq. (Secretary, A.M.L.A.), 300, Davis Avenue, Dayton, Ohio, U.S.A., for full particulars of the competitions.

It is possible that the competition for the "Wakefield"

International Cup will also be held during this model airplane meet, and in that event models to represent England will be chosen by eliminating trials, which will be held early in May; the actual date will be announced at the end of this month. The successful models in the trials will be sent to America by the S.M.A.E., and will be flown in the competition by expert aero-modellists chosen by Mr. M. Haas and Mr. F. Reck, who accompanied the American teams to England the last two years.—S. G. Mullins, Hon. Sec., S.M.A.E., 72, Westminster Avenue, Thornton Heath, Surrey.

Bournemouth Model Aircraft Society.—The above society has now become affiliated to the "S.M.A.E.," and the Hon. Secretary, Mr. H. F. Weller, 18, Madison Avenue, Bournemouth, will be pleased to send particulars to all interested.

THE MODEL AIRCRAFT CLUB (T.M.A.C.)

No. 4 Wing, T.M.A.C., Hackney Marsh.—Sunday, February 22, brought pleasanter flying conditions than of late. Four hours' useful practice was obtained, 14 models taking part. Squadrons 10, 11, and 12 were all well represented.

Mr. Wood's high-wing "Dracula" and the Beard Bros.' little high-wings "Shooting Star" and "Tomtit" flew particularly well, reaching a good height and showing marked stability. The Norris Bros.' full and half-size Resurgams did well, the larger model making splendid landings.

Messrs. Young, Jope, and Knight flew the low-wing "Kitten," and were able to obtain some very high flights, followed by good glides, including one of 20 seconds, and a number of three-point landings.

Seven new models are under construction, and should be ready for test at an early date.

A. E. Jones, Hon. Sec., 48, Narcissus Road, West Hampstead, N.W.6.

THE ROYAL AIR FORCE

London Gazette, March 3, 1931

General Duties Branch

Pilot Officer on probation J. H. Supple is confirmed in rank (Feb. 21). The follg. Pilot Officers are promoted to rank of Flying Officer:—C. E. Morse (Dec. 28, 1930); C. E. Spencer (Jan. 1); W. V. L. Spendlove (Jan. 27); A. C. Bailey, D. Carr, J. E. C. McClure, R. M. Noblston, L. Watson (Feb. 15); E. Poole, with seny., of Feb. 15 (Feb. 16).

The follg. Lieuts., R.N., Flying Officers, R.A.F., cease to be attached to R.A.F. on return to Naval duty:—E. J. E. Burt (Feb. 6); A. M. Pilling (Feb. 9). The follg. are placed on retired list (March 1):—Sqdn.-Ldr. D. E. Stodart, D.S.O., D.F.C.; Flying Officer A. Page, Flying Officer P. Coley is placed on retired list and is granted permission to retain rank of Flight Lt. (March 1).

The follg. Pilot Officers are promoted to the rank of Flying Officer:—E. C. Fieldsend (Jan. 1); N. D. B. Wood (Jan. 1); D. Hay (Jan. 3); E. G. Villiers (Jan. 8); F. W. Moncrieff (Jan. 12); J. P. Dewsbury (Jan. 15); J. Leigh (Jan. 17); C. H. N. L'Estrange (Jan. 17); W. M. E. Crump (Jan. 17); R. M. Henning (Jan. 18); F. H. Peers (Jan. 22); G. U. Hayns (Jan. 24); G. B. Rahr (Jan. 29); M. Spurway (Feb. 10). The follg. Pilot Officers on probation of Special Reserve are confirmed in rank:—R. A. Hall (Dec. 1, 1930); A. T. Laws (Dec. 1, 1930); T. N. C. Burrough (Jan. 28). Flying Officer E. W. Seymour-Hosley is transferred from Class AA (ii) to Class C (March 1); Pilot Officer on probation B. L. Macassey relinquishes his commn. on account of ill-health (Feb. 7). The follg. relinquish their commns. on completion of service:—Flying Officer H. A. Bayne (Aug. 29, 1930); Flying

Officer F. Larman (Dec. 9, 1930); Pilot Officer A. Barron (Jan. 10); Flying Officer J. R. W. Alexander (Jan. 13). The commn. of Pilot Officer on probation J. Sim is terminated on cessation of duty (Feb. 4).

Stores Branch

Pilot Officer on probation G. C. Allen is confirmed in rank and promoted to rank of Flying Officer (Jan. 10); Flight Lt. H. Parker is placed on retired list (Feb. 28).

Wing-Comdr. F. A. J. B. Wiseman, O.B.E., relinquishes his commn. on completion of service, and is permitted to retain his rank (Feb. 17).

Accountant's Branch

Flying Officer J. P. A. Fulton relinquishes his commn. on completion of service (Oct. 1, 1930).

Medical Branch

Flight Lt. G. R. Nodwell, M.B., relinquishes his commn. on completion of service (Jan. 29).

Memorandum

The permission granted to 2nd Lt. P. F. Fenner to retain his rank is withdrawn on his enlistment in Supplementary Reserve (Jan. 13).

AUXILIARY AIR FORCE

Accountant Branch

No. 601 (COUNTY OF LONDON) (BOMBER) SQUADRON.—Flying Officer D. H. W. Arnot resigns his commn. (Feb. 19). The follg. to be Pilot Officer:—J. G. S. Donaldson (Feb. 19).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Group Captain: R. H. Verney, O.B.E., to Elec. and Wireless School, Cranwell, to command, on completion of Senior Officers' War Course, Greenwich, 25.2.31.

Wing Commander E. B. Beauman, to No. 1 Air Defence Group H.Q., for Air Staff duties, 23.2.31.

Squadron Leader E. B. Rice, to No. 2 Armoured Car Company, Transjordan, 29.12.30.

Flight Lieutenants: R. L. McK. Barbour, D.F.C., A.F.C., to No. 17 Sqdn., Upavon, 12.2.31. E. B. Addison, to Elec. and Wireless School, Cranwell, 16.2.31. F. J. Barnett, M.C., to No. 503 Sqdn., Lincoln, 24.2.31. W. Catchpole, A.F.C., to R.A.F. Depot, Uxbridge, 27.2.31. C. E. Horrex, A.F.C., to No. 2 Flying Training School, Digby, 23.2.31. S. H. Ware, to No. 207 Sqdn., Bircham Newton, 23.2.31. G. D. Middleton, to R.A.F. Depot, Uxbridge, 8.2.31. B. K. D. Robertson, A.F.C., to H.Q., Coastal Area, 23.2.31. B. H. Godfrey, to R.A.F. Training Base, Leuchars, 25.2.31. H. A. J. Wilson, O.B.E., to R.A.F. Depot, Uxbridge, 24.1.31. G. S. Hodson, A.F.C., to No. 58 Sqdn., Worthy Down, 21.2.31. W. H. Burbury, to No. 4 Sqdn., S. Farnborough, 27.2.31.

Flying Officers: K. C. McKenzie, M.B.E., to H.Q., Coastal Area, 16.2.31. B. C. Yarde, to School of Naval Co-operation, Lee-on-Solent, 15.2.31. K. C. T. Marshall, to R.A.F. Training Base, Leuchars, 8.2.31. H. P. Wilson, to No. 32 Sqdn., Kenley, 21.2.31. N. Alexander, to No. 207 Sqdn., Bircham Newton, 23.2.31. J. E. Allen, to No. 1 Air Defence Group H.Q., 9.2.31. W. J. P. Sloan, to R.A.F. Depot, Uxbridge, 2.2.31. R. D. Williams, to R.A.F. Base, Calshot, 21.2.31.

Pilot Officers: L. W. C. Bower, to No. 11 Sqdn., Risalpur, India, 13.2.31. E. J. P. Davy, to No. 30 Sqdn., Mosul, Iraq, 27.1.31. G. D. Emms, to No. 30 Sqdn., Mosul, Iraq, 27.1.31. R. L. Wallace, to No. 17 Sqdn., Upavon, 14.2.31.

Pilot Officers: H. T. Bennett, to R.A.F. Base, Calshot, 8.2.31. H. T. Clark, R. C. H. Crosthwaite, N. C. Hendrikz, all to No. 2 Sqdn., Manston,

1.2.31. L. T. G. Barber, W. J. Brighty, D. M. Gordon, J. A. Hankins, J. R. Palmer, all to No. 4 Sqdn., S. Farnborough, 1.2.31. G. A. C. Foster, to No. 7 Sqdn., Worthy Down, 1.2.31. F. G. L. Bain, M. P. Price, both to No. 9 Sqdn., Boscombe Down, 1.2.31. H. J. Dabinett, to No. 10 Sqdn., Upper Heyford, 1.2.31. L. A. Hutchings, R. L. Kippenberger, both to No. 12 Sqdn., Andover, 1.2.31. C. A. M. Kyrke-Smith, R. W. G. Love, both to No. 16 Sqdn., Old Sarum, 1.2.31. R. B. Wardman, J. R. Watson, both to No. 26 Sqdn., Catterick, 1.2.31. G. S. Barrett, to No. 33 Sqdn., Bicester, 1.2.31. M. H. Kelly, to No. 58 Sqdn., Worthy Down, 1.2.31. Hon. F. D. H. Lea Smith, to No. 101 Sqdn., Andover, 1.2.31. K. N. Sayers, to No. 4 Sqdn., S. Farnborough, 12.2.31. H. J. Ward, to R.A.F. Depot, Uxbridge, 10.2.31. W. F. Hilchie, to No. 2 Sqdn., Manston, 10.1.31.

Stores Branch

Flying Officers: E. F. Smith, to No. 8 Sqdn., Aden, 13.2.31. L. Taylor, to No. 30 Sqdn., Mosul, Iraq, 2.1.31.

Medical Branch

Wing Commander B. A. Playne, D.S.O., to H.Q., Aden Command, pending posting as Principal Medical Officer, 14.2.31.

Squadron Leader J. R. Crolius, to H.Q., R.A.F., Middle East, Cairo, 10.2.31.

Flight Lieutenants: W. E. Barnes, to H.Q., Aden Command, 14.2.31. J. D. Leahy, M.C., to H.Q., R.A.F., India, New Delhi, 14.2.31.

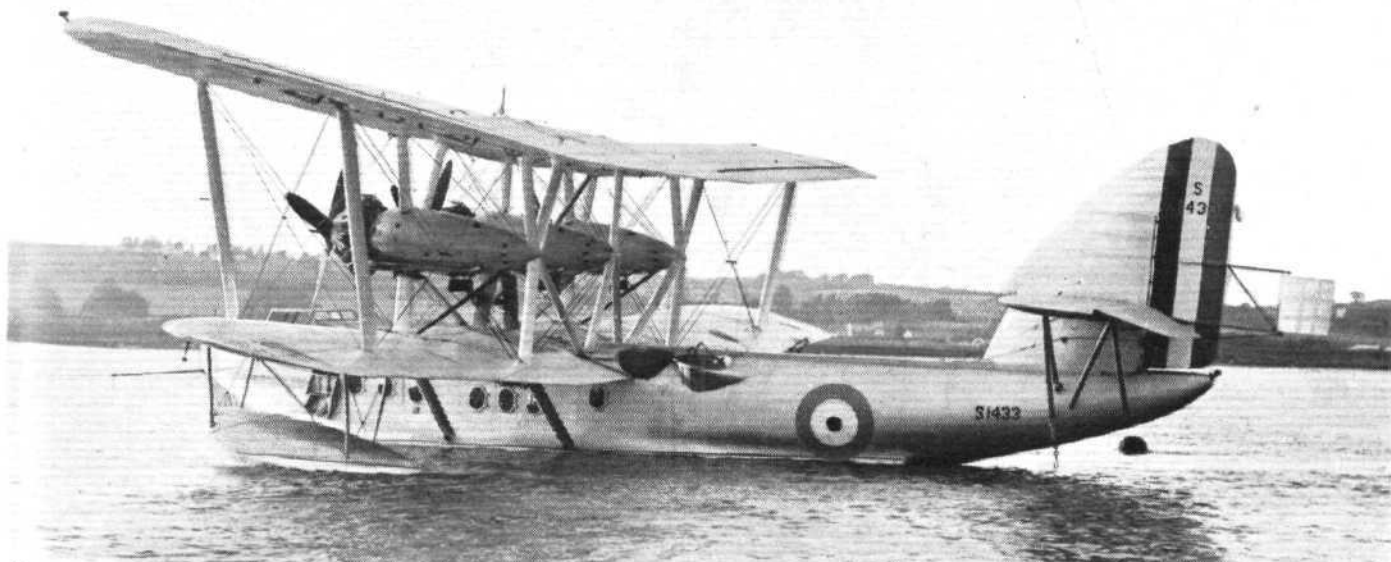
Flight Lieutenants: T. W. Wilson, to School of Photography, S. Farnborough, 2.3.31. M. J. Cahalane, to Inspector of Recruiting, 2.3.31.

Chaplains Branch

Rev. D. F. Stephens, M.A., to Station H.Q., Boscombe Down, 1.2.31.

Accountant Branch

Flying Officer R. D. Pratt, to Marine Aircraft Experimental Estab., Felixstowe, 1.2.31.



THE SHORT "RANGOON" FLYING BOAT: Three of these machines are now flying to Basra to join No. 203 (Flying Boat) Squadron, R.A.F. The "Rangoon" is fitted with three Bristol "Jupiter" engines. (FLIGHT Photo.)

AIR POST STAMPS

By DOUGLAS ARMSTRONG

Newfoundland's Latest

A NOTABLE addition to the air stamps of the Empire comes from Newfoundland in the form of a set of three permanent air mail values for use in connection with the regular service about to be put in operation between St. John's and northern part of the island during the winter months by Newfoundland Airways, holders of the Government contract. These striking vignettes have been engraved and printed in London by the firm of John Dickinson and Co., after designs suggested by Mr. A. B. Perlin, a local aerophilatelist, and were first put on sale on January 6, 1931. The 15 cents, printed in sepia with a picture of a winter scene in a Newfoundland forest, a postal courier with his dog-team and sledge and an aeroplane passing overhead, represents the local air mail fee, whilst the 50 cents green, depicts the transportation of mails by sea and air. In the foreground is seen an old-time sailing ship with mails from England entering the Narrows of St. John's harbour, together with Sir John Alcock's Vickers-Vimy aeroplane taking off with the first transatlantic air mail in June, 1919. This value is intended for letters despatched by air to Canada and the U.S.A. The third stamp, \$1 blue, will be reserved for future transatlantic mail flights. It shows, appropriately enough, a map indicating the routes followed by historic transatlantic flights, commencing with Hawker's ill-starred attempt and ending with Kingsford-Smith's flight from Ireland to Harbour Grace last year.

S.W. African Air Stamps

THE recent appearance of 4d. and 1s. air mail stamps of the Union of South Africa overprinted "S.W.A." for provisional use in the mandated territory of South-West Africa gave rise to some speculative buying of the 1s. value on the strength of an unfounded rumour to the effect that only 2,000 copies were included in the first printing in small type. Actually it transpires that equal numbers of the two values, viz., 100 sheets of 120, were thus overprinted, so that there should be quite enough to go round. A second supply of the 1s. stamp only materialised almost immediately, the letters "S.W.A." being much bolder, but so far the 4d. has not followed suit. As definitive air mail stamps in denominations 3d. and 10d. showing an aeroplane and a biplane respectively flying over Windhoek, the capital, are announced for issue early in 1931, the emergency printings may turn out to be good property, after all; but the prices lately quoted are, to say the least, somewhat ahead of the market.

Italian Transatlantic Flight Stamp

To the stamps that commemorate famous transatlantic flights has just been added one issued by the Italian Government to celebrate the successful formation flight by "Savoia" flying boats from Rome to Rio de Janeiro last January. Of



the face value 7.70 lire, it bears the superscription "la Crociera Aerea Transatlantica Roma-Rio de Janeiro. Gennaio 1931. A.I.X.E.F." above a vignette depicting a flight of seaplanes against a dark sky in which shines the constellation of the Southern Cross. The colour is dark blue, and the stamp is available for ordinary postage for a limited period of one month only.

First Jamaica Air Mail

JAMAICA was linked by aerial mail with the United States, Central America, and the other West Indian islands for the first time on December 10, 1930, when the special air mail fee of 8d. was prepaid by means of ordinary postage stamps. A souvenir cachet was applied, however, to letters carried on the inaugural flight showing a large outline map of Jamaica in the centre together with the inscription "Air Mail—First Flight Jamaica to Miami, U.S.A.," struck in violet ink.

It is reported that the proposed issue of air post stamps in British Honduras has been postponed *sine die*; nor is there any further news of the projected 6d. air mail stamp for the Bahamas. So far as the Crown Colonies and Dependencies are concerned, the powers that be seem to have set their faces rigorously against the creation of separate stamps for air post purposes.

New Czech Aero Stamps

PERHAPS the most artistic series of air post stamps in use over the trans-European air post system today is that which has just been taken into use by Czecho-Slovakia, with its finely engraved vignettes showing aeroplanes of various types over characteristic local landscapes by the artist Karl Seizingers. A view of the Riesengebirge Mountains adorns the 50 haleru green and 1 kr. carmine, both in small format, whilst the Tatra Mountain is seen in the distance upon the 2 kr. dark olive, 3 kr. claret, 4 kr. blue, and 5 kr. brown. An aeroplane encircling the Hradschin citadel of Prague is the subject of the two highest denominations of this series, viz., 10 kr. ultramarine and 20 kr. violet-black.

◆ ◆ ◆ ◆

PUBLICATIONS RECEIVED

The Airplane. By F. Bedell, Ph.D. Rewritten and enlarged, with the assistance of T. E. Thompson, M.E. London: Macmillan and Co., Ltd. Price 16s. net.

Powdered and Granulated Aluminium. The British Aluminium Co., Ltd., Adelaide House, King William Street, London, E.C.4.

The Conquest of the Atlantic by Air. By Charles Dixon. London: Sampson, Low, Marston and Co., Ltd. Price 6s. net.

Regulations for University Air Squadrons. Air Publication 1401. London: H.M. Stationery Office, W.C.2. Price 4d. net.

Hugo Junkers: Ein Leben als Erfinder und Pionier. By C. Hanns Pollog. Carl Reissner Verlag, Dresden, N.6, Germany. Price M. 5 and M. 6k50.

Bakelite Progress. Vol. I, No. 1. February, 1931. Bakelite, Ltd., 68, Victoria Street, London, S.W.1.

Sixteenth Annual Report of the American National Advisory Committee for Aeronautics, 1930. Superintendent of Documents, Washington, D.C., U.S.A. Price 20 cents.

Aluminium Facts and Figures. The British Aluminium Co., Ltd., Adelaide House, King William Street, London, E.C.4.

Motor Boat Manual. 10th Edition. Temple Press, Ltd., Rosebery Avenue, E.C. Price 5s. net.

◆ ◆ ◆ ◆

NEW COMPANIES REGISTERED

WILLIAM E. APPLEBY, LTD., 1, Saville Place, Newcastle-upon-Tyne.—Capital £5,000, in £1 shares. Objects, to carry on the business of William E. Appleby (N/C) and Co., carried on by W. E. Appleby, at 217-219, Jesmond Road, Newcastle-upon-Tyne, and that of manufacturers of aircraft models and all other kinds of models, etc. Directors, W. E. Appleby, "Merrickville," The Drive, Benton, Northumberland; J. H. Boyd, 1, Saville Place, Newcastle-upon-Tyne.

B. A. C., LTD., Lower Stone Street, Maidstone, Kent.—Capital £3,000, in £1 shares. Designers, constructors and operators of all kinds of land and marine aircraft, motor vehicles, motor boats and marine engines, aircraft motors, trailers, etc. Directors, C. H. Lowe-Wylde, A.R.Ae.S., 56, Sutton Road, Maidstone; K. B. Green, Alver Cottage, Lancel Lane, Loose, Maidstone (managing director of H. Allnutt and Son, Ltd.); Mrs. Sheila M. Green, Alver Cottage, Lancel Lane, Loose, Maidstone.

FLIGHT, The Aircraft Engineer and Airships.

36, GREAT QUEEN STREET, KINGSWAY, W.C.2.

Telephone (2 lines): Holborn, 3211.

Holborn, 1884.

Telegraphic address: Truditur, Westcent, London.

SUBSCRIPTION RATES POST FREE

UNITED KINGDOM		UNITED STATES		OTHER COUNTRIES*	
	s. d.				s. d.
3 Months	8 3	3 Months	\$2.20	3 Months	8 9
6 "	16 6	6 "	\$4.40	6 "	17 6
12 "	33 0	12 "	\$8.75	12 "	35 0

* Foreign subscriptions must be remitted in British currency.

Cheques and Post Office Orders should be made payable to the Proprietors of "FLIGHT," 36, Great Queen Street, Kingsway, W.C.2, and crossed "Westminster Bank."

Should any difficulty be experienced in procuring "FLIGHT" from local newsvendors intending readers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.